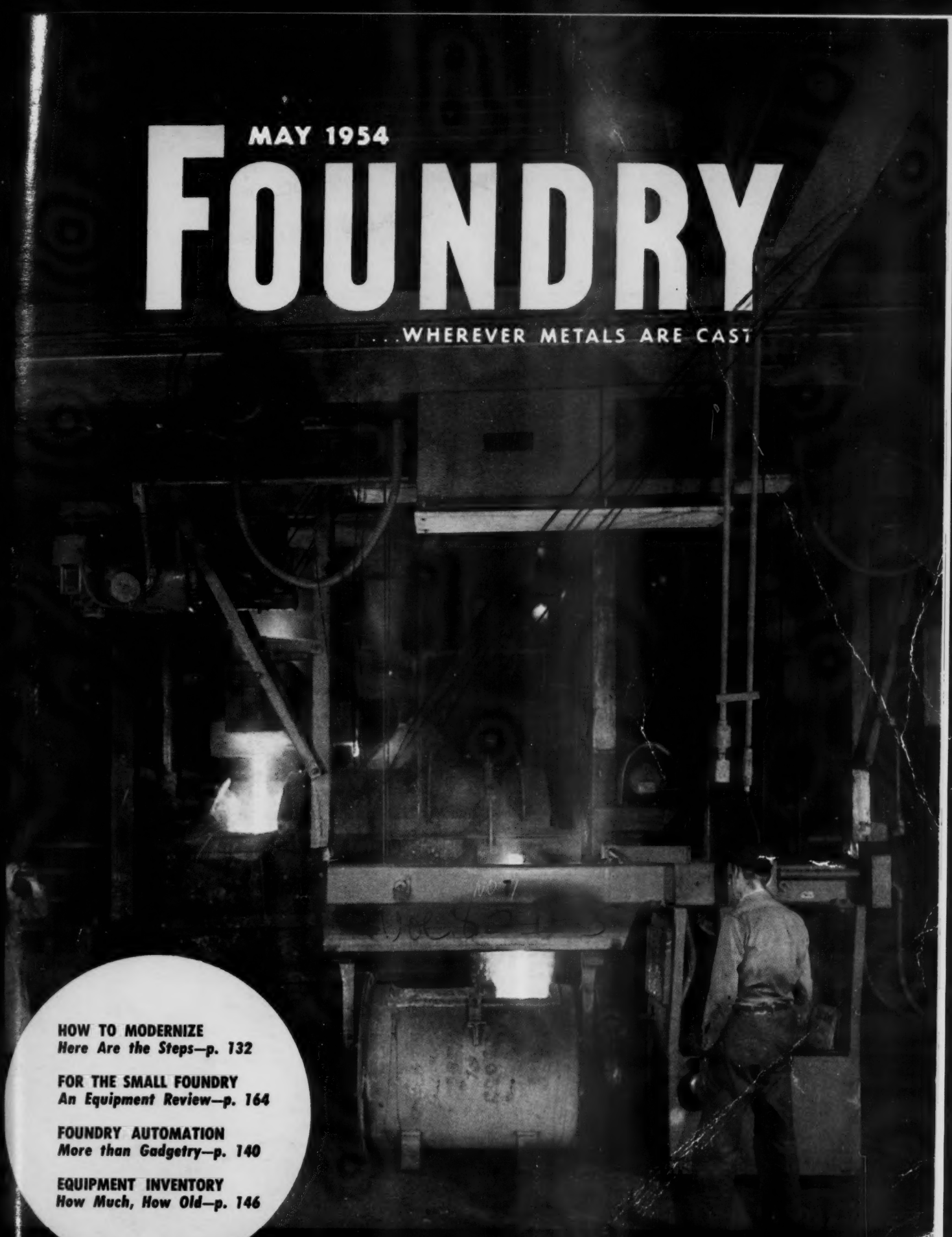
MAY 1954

FOUNDRY

...WHEREVER METALS ARE CAST



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Here Are the Steps—p. 132

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How Much, How Old—p. 146

AFS CONVENTION and SHOW, CLEVELAND, MAY 8-14

✓R v. 82 pt. 2 My-Ag '59

The man who uses your castings can MACHINE UP TO 35% MORE CASTINGS PER TOOL

Iron deoxidized with FERROCARBO® patented Briquettes is *premium* iron... free from segregations, inclusions, and deep hard chilled spots. It is more easily machined, adds up to 35% to the life of cutting tools...often permits increases in machining speeds. In addition, the castings you supply are finer-grained, denser, stronger than castings made from untreated iron.

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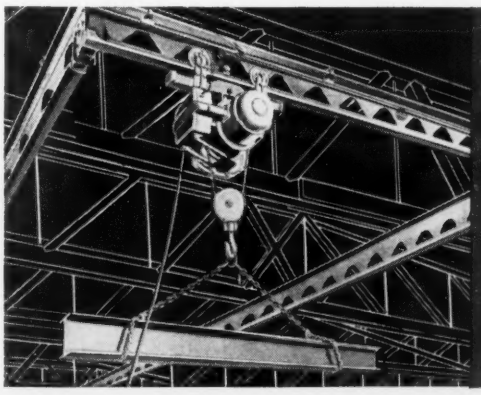

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"GOOD HOUSEKEEPERS"

DUSTLESS SEACOAL

AND PITCH BINDERS

FEDERAL now offers "DUSTLESS" seacoal and pitch binders as a contribution to the movement toward "better housekeeping" in foundries. Chemically treated to minimize dustiness in handling, these sand additives will help provide more healthful working conditions—by substantially reducing skin irritation and dust inhalation. There's economy in FEDERAL "dustless" products, too, despite a slightly higher cost. In addition to the benefits from "better housekeeping", their use holds to an absolute minimum the usual dust-losses in air-swept mixing and handling equipment.

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FOUNDRY

May 1954

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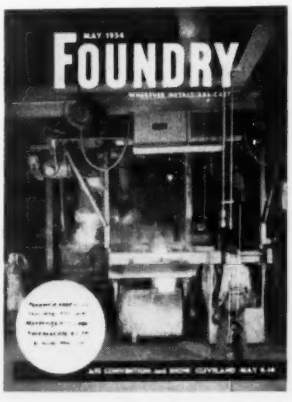

THE COVER: Tapping a cupola at the Ford Cleveland Foundry, one of the plants open for inspection during the convention

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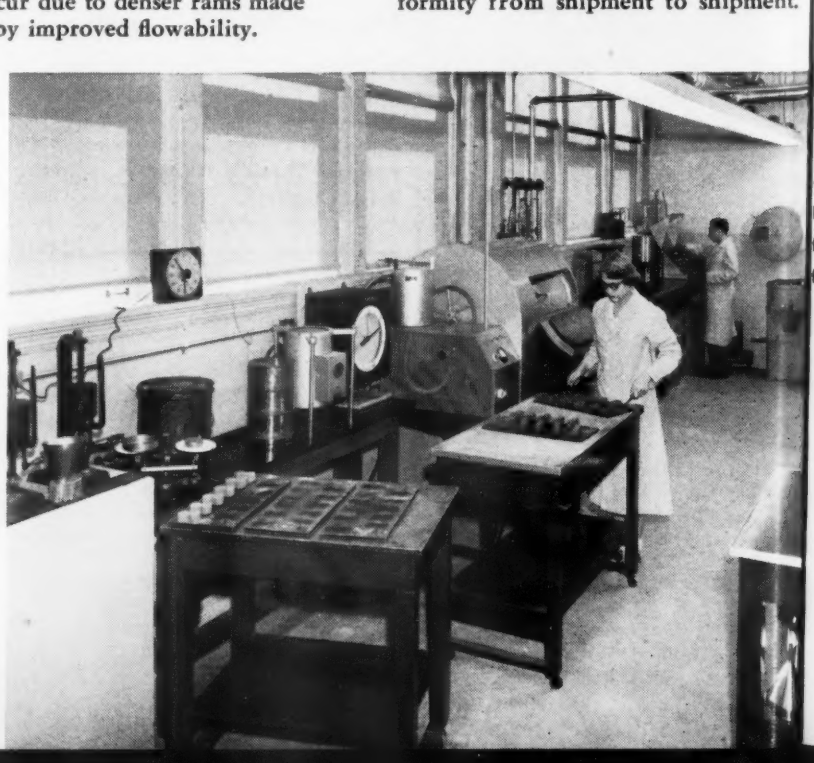
the fastest-moving line in the Foundry Field... on its way to you . . fr

Archer **LIN•O•CEL** is the most effective sand stabilizer available. It improves flowability, which in turn, produces better tolerance and definition. Because LIN-O-CEL compensates for sand expansion, it stops rat-tails, buckles, and scabs which normally might occur due to denser rams made possible by improved flowability.

LINOIL, the most-used core oil in America, produces stronger cores at less cost. You can find among the seven grades of "700 LINOILS", for instance, an oil practically tailor-made to your core requirements. Whatever the grade selected, you can depend upon uniformity from shipment to shipment.

STOP!

Whether or not you are using ADM foundry products, it pays periodically to check your core mixture. Proper use of any material will save you production dollars. Your LINOIL man can assist you in analyzing your specific core problems. He is backed by fully-equipped laboratories, experienced ADM chemists, and foundry technicians who will analyze your problems upon request.



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WHEREV
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Impoved foundry methods demand a constant flow of modified oils and binders, as well as entirely new products for core making and molding. The need today is for greater efficiency at lower cost.

ADM keeps pace with the foundry industry by anticipating its needs through never-ending research. Proof lies in the fact that more than half the core binders consumed in American foundries are made by ADM. Furthermore, foundrymen know they can rely on ADM for absolute uniformity . . . and service second to none.

-from ONE SOURCE!

INDUCTOL | FREFLO | ADMIREZ

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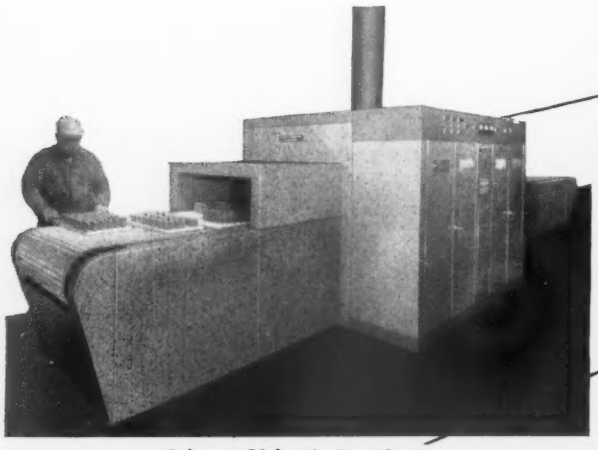
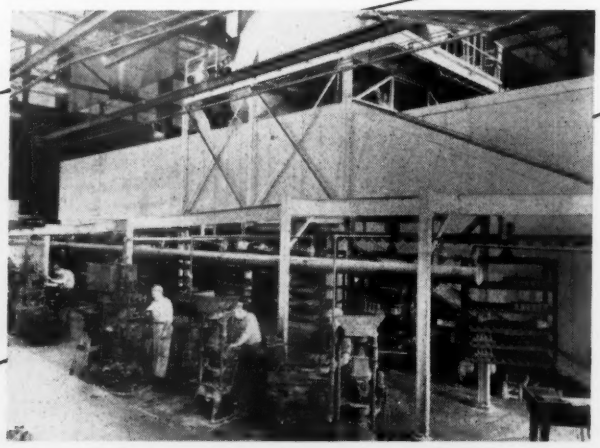
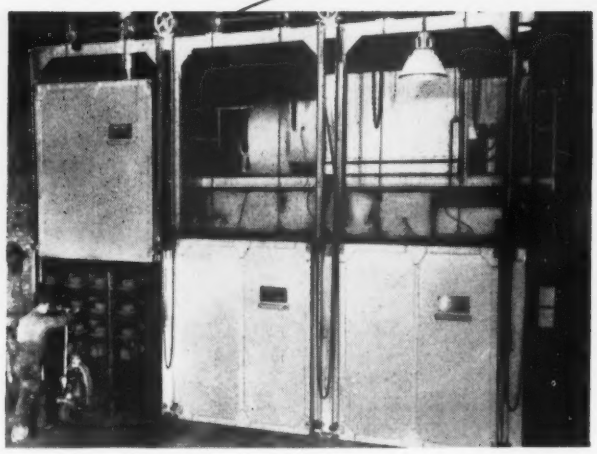
WRITE FOR BULLETIN 54



Coleman Dielectric Core Oven



Coleman Monorail Conveyor Core Oven



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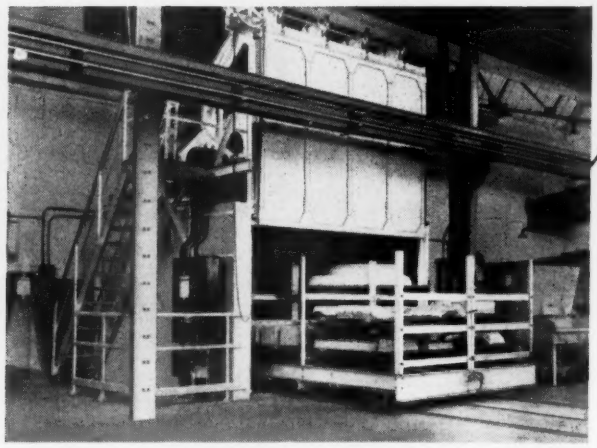

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*Let us recommend the **RIGHT** type of core or mold oven for your requirements—we make them ALL!*

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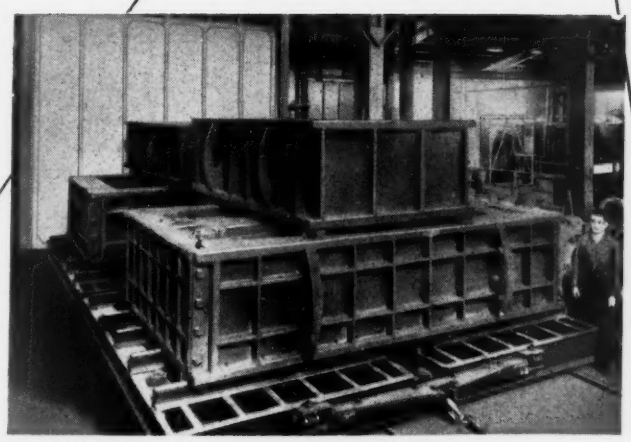
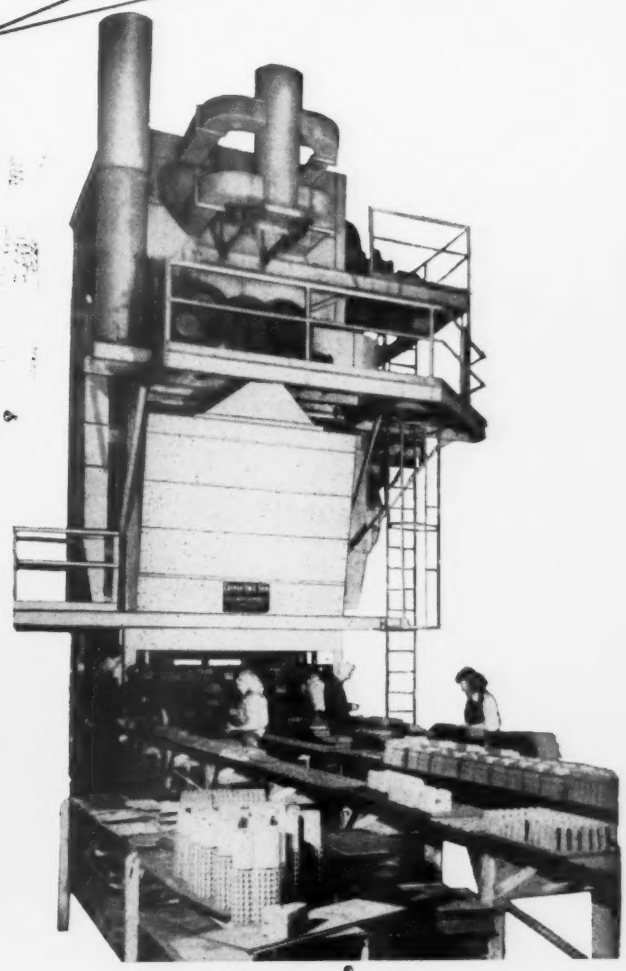
Every Type.. Every Method

to fit your requirement BEST!



Coleman Car Type Mold Oven



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Only COLEMAN offers a complete line of foundry ovens with all these advantages

RECIRCULATING HEATING OR DIELECTRIC SYSTEMS to meet your requirement best.

DEPENDABLE BAKING AND DRYING. Coleman Ovens remove all uncertainties in core baking and mold drying. Rejects and make-overs are eliminated.

INCREASED LABOR SAVING. Efficient and modern mechanical designs reduce handling and other indirect labor to a minimum.

HEAVY DUTY CONSTRUCTION. Responsible for dependable performance, economical operation, and minimum maintenance cost under rugged service requirements.

MAXIMUM FUEL ECONOMY. Coleman Heating Systems use the most economical fuel available to you — gas, oil, stoker-coal, electricity, etc.

FLEXIBILITY AND ACCURATE CONTROL to bake oil or resin binders—whichever is most satisfactory for your requirements.

BETTER WORKING CONDITIONS. Positive ventilation built into Coleman Ovens prevents leakage of fumes and gases—helps to make the core department a good place to work.

ADVANCED OVEN "KNOW-HOW". Coleman Engineers have pioneered and developed the most efficient oven designs to meet the highly specialized needs of modern foundry methods in all classes of work.

WIDEST EXPERIENCE. Gained through 50 years of specialization in foundry ovens and the building of more than 11,000 successful Coleman Oven installations.

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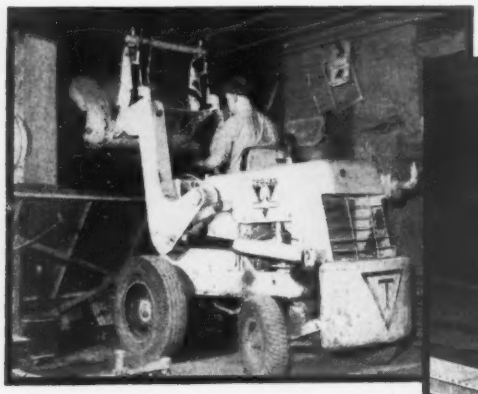
WORLD'S ONLY COMPLETE LINE OF FOUNDRY OVENS

Trojan Loadsters are . . .

MAN-HOUR SAVERS!

Model LA-40's versatility increases productivity. Whether unloading sand from boxcars, carrying it to mullers or storage, delivering it to molding stations or coremakers, or scooping up from pouring floors, the LA-40 does it FASTER and SAFER.

Trojan's LA-40 handles coke, slag, castings and waste just as quickly and easily, using a minimum of working space (turns in a 6'6" radius).



Model LA-40 dumping processed core and molding sand.

Model LA-40 delivering core and molding sand to molding and pouring section.

Model LA-40 picking up core and molding sand for conditioning.

exclusive BIG 3 features:

1 Reverse curve arms* for safety!

Even when the bucket is fully raised, constant 360° vision and complete safety for your operator is maintained.

(*U.S. Pat. 2,645,369)

2 Low load carrying position!

A low load is a safe load for stability and speed; especially when handling bulk material. Your operator will like Trojan's "wheel level" carrying position.

3 Independent bucket action!

Just flipping the bucket closed, this operator gets a full load everytime. Trojan's independent bucket action pries loose hard packed material, too.

There's one in the Trojan Loadster Line to fit your need —
Model LA-40 — Model LMS-75 — Model LC-100 — Model LC-100-B

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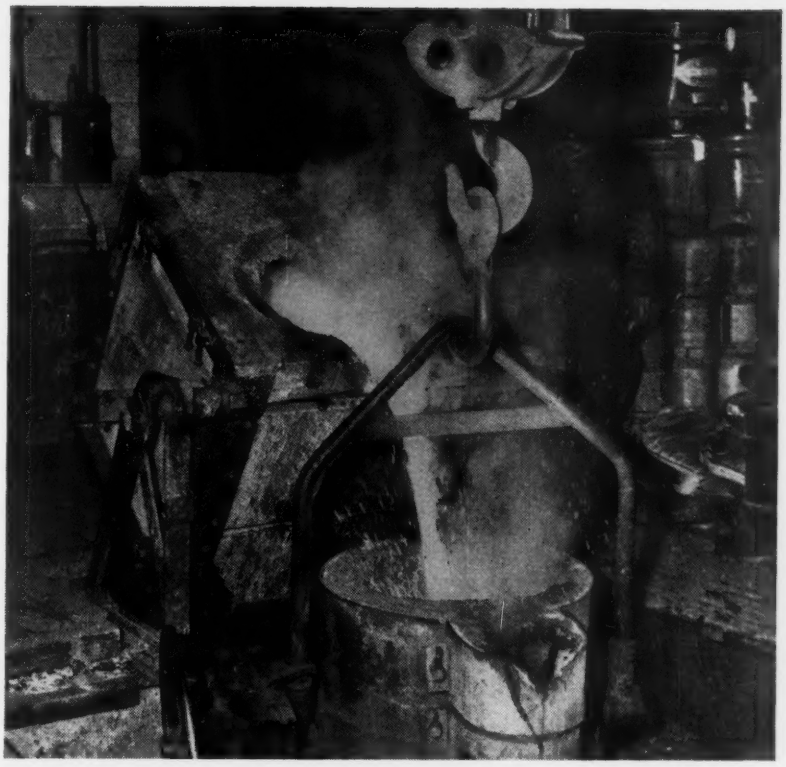

HIGH ALLOY STEEL is being poured here from a 1000-lb. high-frequency induction furnace. It is lined with a Norton MAGNORITE* refractory cement which lasts 16% longer than the cement previously used.

CLOSE-UP OF THE SAME FURNACE, taken immediately after metal has been poured, shows how effectively this engineered-to-the-job Norton MAGNORITE cement resists mechanical and chemical attack.

How much more steel will you melt per lining *with Norton*

ENGINEERED Rx PRESCRIBED

MAGNORITE cements?

It's easy to find out how much longer Norton MAGNORITE refractory cement will last in your high-frequency furnaces than your present linings. Just call on the 40-year problem-solving experience of Norton Refractory Research which gave this satisfied customer (name on request) 16% longer lasting lining.

Whether you melt straight steel or heat-resistant compositions, you'll get a Norton MAGNORITE cement that's Engineered Rx Prescribed to fit your exact requirements. It will withstand temperatures up to 3250 F. if need be. It will have a high-rammed density that offers great resistance to metal penetration, erosion and chemical attack . . . and freedom from shrinkage cracks that often lead to furnace failure. Why not run a test on one of your furnaces soon?

Whatever your metal-melting problem, you can depend on Norton Research to help you. Working with MAGNORITE*, ALUNDUM*, CRYSTOLON* and FUSED STABILIZED ZIRCONIA cements and special shapes, Norton engineers are sure to come up with the right answer for you.

For full details about Norton Rx Refractories, contact your nearby NORTON refractories engineer, or write to NORTON COMPANY, 304 New Bond Street, Worcester 6, Mass. *Canadian Representative:* A. P. Green Fire Brick Co., Ltd., Toronto, Ontario.

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Making better products... to make other products better

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Will your present belts stand the REPLACEMENT test?

Imperial did . . . on this elevator handling hot sand

The real test of satisfactory belting performance comes when the plant operator orders a replacement for an original belt. When this elevator was installed at the Allegheny Ludlum Steel Corporation, Buffalo, N. Y., the conveyor company equipped it with an Imperial Standard Sahara (150′ x 12″ x 7 ply). For 4½ years that belt operated 16 hours a day elevating hot shakeout sand.

Its long life with minimum maintenance was an important cost factor in selecting a replacement — another Standard Sahara Belt.

Job-designed for long life

Imperial Sahara Belts are made of heavy-duty hard silver duck, double stitched to positively prevent ply separation. Special impregnation gives protection from the destructive action of sustained high temperatures. Manufactured in three types: Standard Sahara for temperatures to 300° F.; Insulated Sahara, up to 450°; Super Insulated Sahara, up to 600°. Let us make money-saving recommendations on your conveying or elevating jobs.

You expect more from Imperial . . . and you get more

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BELTING CO.

1755 S. Kilbourn Ave., Chicago 23, Ill.

Engineered Belting— The Right Belt for Each Job

WITH THE EDITORS

REMINISCING: For the ninth time in 58 years, the American Foundrymen's Society has selected Cleveland as the site of its annual convention. Only Chicago equals this record of nine conventions, but the magnitude of the meetings staged in the two cities differs widely. While all of the meetings in Cleveland have included a major exhibition of foundry equipment, supplies and services, three of the Chicago affairs were without exhibits, and two had limited exhibits in the Stevens Hotel. Interesting things have happened at these Cleveland conventions, and since I have helped cover seven and have read of the other two in old issues of FOUNDRY, I thought it might be interesting to reminisce a bit.

* * *

First in 1906: The first Cleveland convention was held in the old armory, June 6 and 7, 1906, in the 11th year of the organization. It is interesting to note in the secretary's report that total receipts for the year were $1540.90, total disbursements $1397.19, leaving a balance in the treasury of $143.71. The exhibition was staged by the recently formed Foundrymen's Supply Association. W. H. McFadden, who still enjoys attending the annual convention, was elected president of AFS, and L. L. Anthes, who expects to be in Cleveland this year, was elected president of the eighth district. Entertainment features at that convention are reported in some detail a little further along in this department.

* * *

Bigger in 1916: The society met in Cleveland for the second time Sept. 11 to 15, 1916, in the twentieth year of the organization. The show, which included 145 exhibitors, was held in a Coliseum, but the 60,000 sq ft of floor space was not sufficient to meet demands and an annex, which is not described in the reports but looks much like a tent in the illustrations, added 10,000 sq ft. The technical program boasted of 72 papers, including a symposium on "Gating of Castings." Ben Fuller, the grand old man of the foundry industry in Cleveland who expects to be in attendance at the Old Timers booth in the coming convention, was elected vice president, and a young fellow from Lewis Institute in Chicago by the name of C. E. Hoyt was elected a director. Another director was V. E. Minich, organizer of the Sand Mixing Machine Co., New York, which now is the American Wheelabrator Corp., Mishawaka.

* * *

First in Auditorium: The third visit of the AFS to Cleveland took place Apr. 30-May 3, 1923. This was the first major show to be held in Cleveland's beautiful new public auditorium, and really provided a shakedown cruise for the auditorium staff. Only the auditorium proper had been built, with the show occupying both the arena and lower floor. But the amount of space available again was not sufficient to meet demands of the more than 200 exhibitors. The electric load was tremendous, and far exceeded the engineers' estimates. As a result, the entire wiring system had to be replaced after the show, and some wondered why the place was not set on fire—while all the equipment was in operation. Dr. Gulliam H. Clamer, Ajax Metal Co., Philadelphia, was elected president, and Thomas W. Pangborn, president, Pangborn Corp., Hagerstown, Md., and L. L. Anthes of Toronto were among those made directors.

I have many fond memories of this affair, for it was my first major show and first encounter with the foundry industry. I was impressed with the magnitude of the operation and the friendliness of the people. I will always remember how H. S. Simpson of National Engineering Co., Chicago, introduced himself as we stood in the registration line, and when he found that I was a neophyte, took the time to tell me about the foundry industry and its great possibilities.

But I must confess that I did not see too much of the show that year. FOUNDRY published a 16-page daily edition on four days of the convention, and I spent a great deal of time "putting the paper to bed." The issues contained news of the convention and exhibitions with many illustrations and a cumulative "Official Registration List." It was quite an undertaking.

* * *

A Mechanized Foundry: Although business was on the skids in 1930, interest of the foundry industry for better and cheaper production meth-

(*Continued on page* 12)

CRUCIBLES

Developed into

THE WORLD'S MOST EFFICIENT NON-FERROUS MELTING UNIT

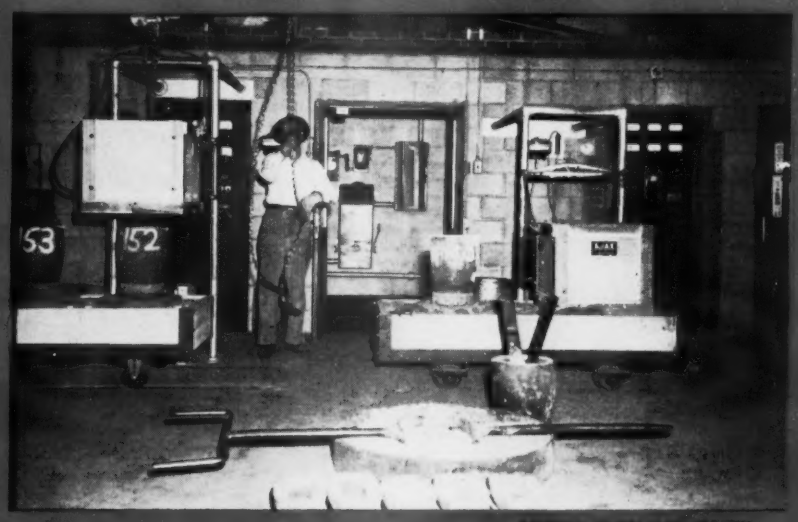
No one knows how long it took one of the ancients to melt a few pounds of bronze—probably all day.

Now with Crucibles, foundries are melting 240 lbs. of bronze in seventeen minutes or fourteen pounds per minute!

The illustration shows the cleanliness and efficiency obtainable with Crucible furnaces.

Comparable results are achieved with other fuels generally available for Crucible melting.

WRITE CRUCIBLE MANUFACTURERS ASSOCIATION FOR "CRUCIBLE MELTERS' HANDBOOK"; MAILED FREE. OR ASK ANY CRUCIBLE MANUFACTURER ABOUT SIZES AND SHAPES AVAILABLE.



Installation of Electric Induction Crucible Furnaces at Wollaston Brass and Aluminum Foundry, North Quincy, Mass., consists of two No. 80 Crucible furnaces lift coil type and one tilting Crucible furnace (not shown) 800 lbs bronze capacity. Illustration shows method of alternate use of Crucibles by lifting the furnace coil and replacing full hot Crucible with cold Crucible already charged.

CRUCIBLE MANUFACTURERS ASSOCIATION

27 WILLIAM STREET, NEW YORK 5, N. Y.

THESE FIRMS CAN TAKE CARE OF ALL YOUR REQUIREMENTS FOR CRUCIBLES

ROSS-TACONY CRUCIBLE CO.

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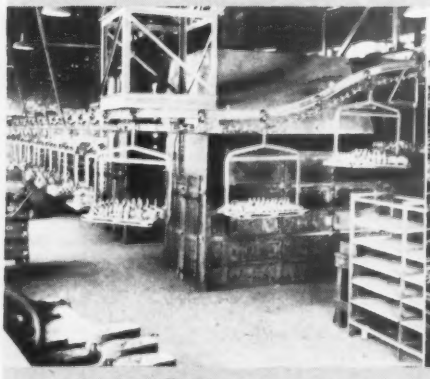
whatever you're handling—
Molds - Cores - Castings

In the modern foundry, molds are handled easily and safely on Mathews Roller Conveyers.



Overhead Trolley Conveyers in core room.

Boxes of castings move to grinders on Roller Conveyer lines served by transfer cars.

you'll do it best with Mathews Conveyers

Modern foundry production schedules require efficient material handling methods. In Foundries everywhere, Mathews Conveyers are helping to keep these schedules. Whatever your particular foundry conveying problem, Mathews engineers will help you work it out. Why not call your Mathews representative. Have him show you how Mathews Conveyers are on the job in Foundries all over the United States and Canada.

FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION INC. MEMBER FEMA

MATHEWS CONVEYERS

GENERAL OFFICES . . . . . *Mathews Conveyer Company*
ELLWOOD CITY, PENNSYLVANIA

PACIFIC COAST DIVISION . . *Mathews Conveyer Company West Coast*
SAN CARLOS, CALIFORNIA

CANADIAN DIVISION . . . . . *Mathews Conveyer Company, Ltd.*
PORT HOPE, ONTARIO

Engineering Offices or Sales Agencies in Principal American and Canadian Cities

(*Continued from page* 10)

ods made the Cleveland convention, held May 12-15, one of the largest and best ever held. The show occupied the arena floor of the auditorium, plus a huge temporary building on the opposite side of the mall which was built several years before for a railway show, and a covered arcade that extended across the mall connecting the two buildings. The show occupied a total of 125,000 sq ft of floor space.

For a while it seemed that the show might not open. Somebody made a mistake in setting the dates for the annual Cleveland appearance of the Metropolitan Opera Co. the week before the AFS show, and the error was not discovered until it was too late to change either event. Therefore the foundry exhibits for the arena were set up in their relative positions on the floor below. As the last strains of Il Trovatore died away a little before midnight Saturday and the opera fans moved out, an army of men moved in and started to remove seats, the floor that ran from the stage to balcony and the supporting beams. When this had been completed and the hall cleaned, the exhibits were moved from the hall below into place in the arena.

The show opened on time, 12 noon on Monday, just 36 hours after the opera had closed. But it took some doing to accomplish this disappearing trick. The DAILY FOUNDRY, which again was published on four days of the convention, said "Great Obstacles Overcome as Opera Moves Out and Foundry Display Enters Huge Arena," and the heading on the feature story said "Divas To Foundry Devices in 36 Hours."

The feature of the show was an operating foundry in the arena, staged jointly by the Osborn Mfg. Co., and W. W. Sly Mfg. Co., Cleveland, the Cleveland Crane & Engineering Co., Wickliffe, O., and the Pittsburgh Electric Furnace Corp., Pittsburgh. Molds were made and placed on a conveyor, poured, and carried to shakeout and cleaning operations. In all the conventions I have attended since 1923, this joint display was by far the most spectacular.

* * *

Under Chapter Auspices: The next visit of the society to Cleveland was in 1938, when the convention and exhibition was held in the Public Auditorium and recently completed Exhibition Hall. This was the first convention staged upon in-

(*Concluded on page* 14)

MILLIONS of CASTINGS
prove that Harbison-Walker Refractory
STRAINER CORES —*make better castings* —*reduce foundry costs*

7 Standard Sizes

Equivalent gate diameters ranging from ⅝-inch to 1½-inch. Packed in sturdy, handy cartons for molding room use. Note the clean lines and edges.

The marked swing to refractory strainer cores spotlights Harbison-Walker's extensive experience and important accomplishment in this field. Many millions of Harbison-Walker Refractory Strainer Cores are used in widely diversified foundries. The knowledge gained through the service of these strainer cores has guided Harbison-Walker engineers in the development of cores that meet every requirement.

Harbison-Walker Refractory Strainer Cores easily withstand the heat and weight of the molten metal during pouring, the initial heat shock and the erosive effect of fast flowing metal.

Harbison-Walker Strainer Cores are made of highly refractory ceramic material, formed under pressure and fired at high temperatures. They keep castings free of slag, oxides and other impurities, reduce reject losses and materially cut operating costs.

SEE HARBISON-WALKER products at Booth 128, Foundry Exhibit

Write for Samples

of Harbison-Walker Refractory Strainer Cores, and for booklet giving further information. For convenience, please use the coupon.

HARBISON-WALKER REFRACTORIES CO.
Pittsburgh 22, Pennsylvania

Please send samples of Strainer Cores ..... inch equivalent gate diameter, and a copy of your descriptive folder to:

Name_____

Company_____

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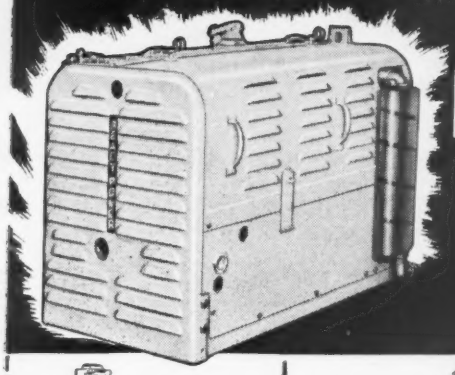
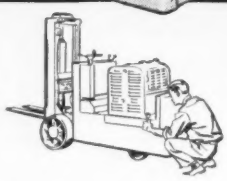
HARBISON-WALKER REFRACTORIES COMPANY
AND SUBSIDIARIES
World's Largest Producer of Refractories
General Offices: Pittsburgh 22, Penna.

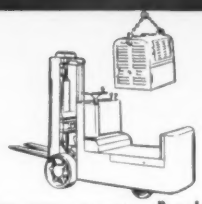
The Most Flexible "Power Package" available for Industrial Trucks!



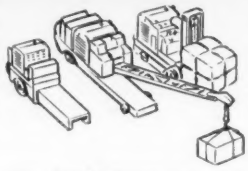
READY-POWER
Gas-Electric Drive



Ready-Power units can be installed in minutes

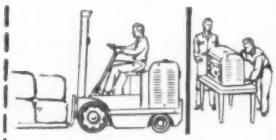


You can remove Ready-Power units in minutes

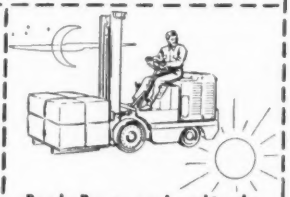


Use Ready-Power on any type of electric truck

Ready-Power units can be interchanged with batteries



"Tune up" a spare Ready-Power while trucks work



Ready-Power-equipped trucks know no time limitations

There are Ready-Power models for all truck sizes

Ready-Power is the originator of gas-electric drive for electric industrial trucks!

You're Invited to see READY-POWER on display
in Booth 416 at the Foundry Show
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The READY-POWER Co., 3813 GRAND RIVER AVE., DETROIT 8, MICH.

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

(*Concluded from page* 12)

vitation of the Northeastern Ohio Chapter, and was featured with the first Northeastern Ohio Day, when operating men of the area were admitted free. This feature has been repeated at all succeeding shows. FOUNDRY's report of the convention stated "Industry Gains Confidence through AFS Convention."

* * *

The Last Four: Other Cleveland conventions were held in 1942, when we reported, "AFS Convention Gives Impetus to War Production," in 1946 when we said "AFS Marks Anniversary—Looks to Future Progress," and in 1950 when we headed the convention report "Technical Progress Evidenced at AFS Convention."

* * *

Pouring Off: The July 1906 issue of FOUNDRY carried the following interesting description of one of the entertainment features of the first AFS convention held in Cleveland.

On Thursday evening the final event of entertainment features took place in the form of a smoker, which was held in the Central Armory, where the exhibits were arranged. The guests were seated at tables, where they were furnished with their molders' tools, which consisted of a souvenir stein, a corn cob pipe, and a bag of tobacco. The Falls Rivet & Machine Co. also presented each person in attendance with a leather case containing "sample cores" which were stated to have been made on the Wadsworth improved core machine. The cores were all cigar shaped and were made of a very fine quality of tobacco, and hence were put to use by the guests.

Very acceptable music was furnished by Steele's orchestra, which is a local orchestra of eighteen pieces. Amusement was also furnished by a vaudeville entertainment of eight acts.

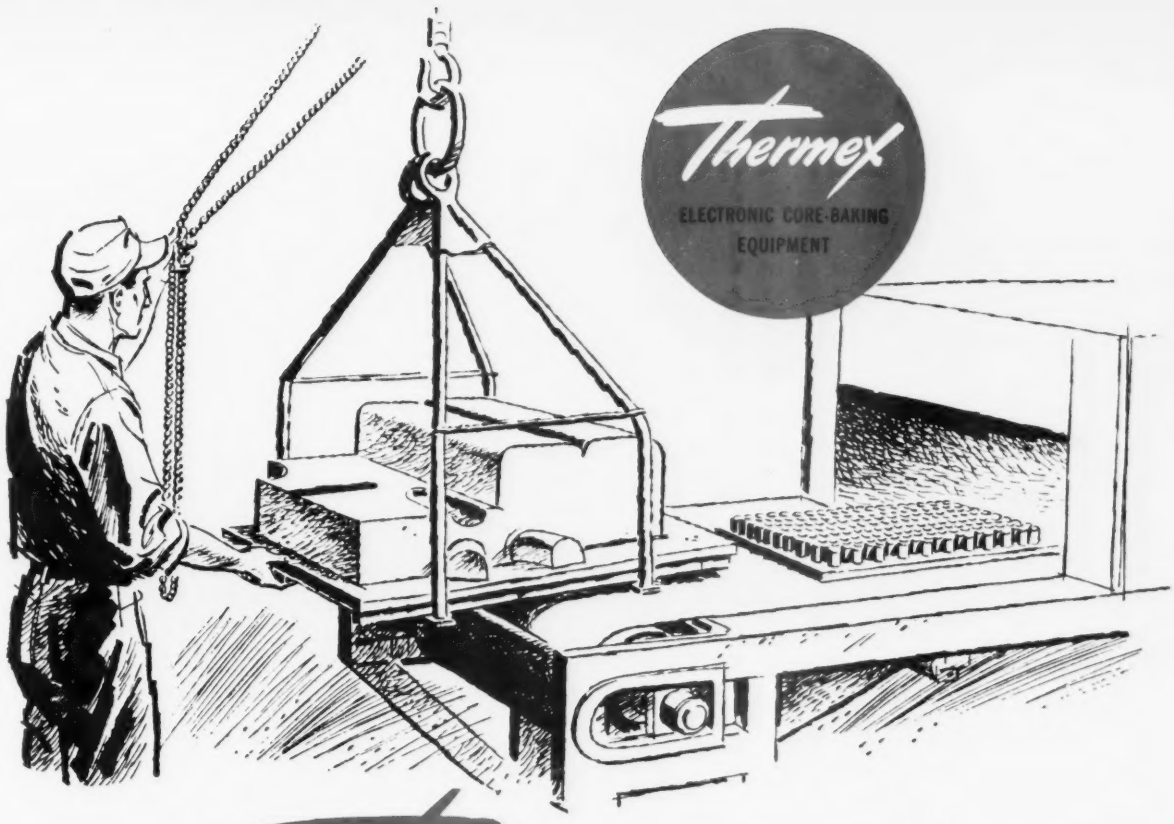
Sandwiches were passed, and lest the members become too dry, liquid refreshment was furnished by pouring off a heat. This was accomplished with the aid of a cupola furnished by the Whiting Foundry Equipment Co. It was stated that the Whiting Foundry Equipment Co. had occasionally furnished amber-colored liquid refreshments, but never before had it been drawn from a cupola of their make. The cupola was placed on the floor next to the platform or stage, and was so arranged that the liquid refreshments were tapped from the spout into hand ladles, and thus carried by the waiters to the various guests at the tables. The steins were filled from the hand ladles, but as there were some 750 people present, it was found impossible to draw the material from the cupola fast enough, hence one of the steel barrels furnished by the Cleveland Wire Spring Co. was pressed into service. This was mounted on a truck, so that it could be carried from place to place, was filled with beer, and trucked down to the middle of the room. The hand ladles were then filled by dipping from the barrel.

The banquet at this year's convention will be held in the same room with a part of the exhibition. Could it be that the similarity ends there?

—o—

A Record: Everyone connected with FOUNDRY is greatly enthused with this issue. With well over 310 pages of advertising and 165 pages of editorial, it represents by far the largest issue of FOUNDRY ever published. Our sincere thanks go to our advertisers, authors of articles and the hundreds of foundries supplying data used in this issue.

Hope you like it. F.G.S.



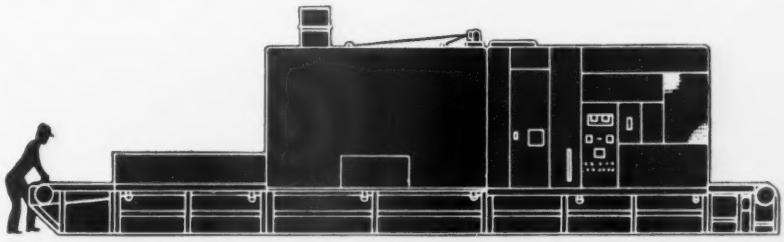
Only *Thermex* Core Bakers with the Tunnel Circuit give you this

FLEXIBILITY and SPEED

WHEN YOU DECIDE to switch to dielectric core baking for *lower costs* . . . for cores varying in height as much as five to one . . . we can show you positive proof that THERMEX* CORE BAKERS with the exclusive Tunnel Circuit are in a class by themselves for performance!

Be sure you get the facts about "Electrode Voltage" and what it means in terms of coreroom flexibility and production speed. Ask us about this at the Foundry Show! Write for specifications.

*THERMEX—Trade-Mark Reg. U.S. Pat. Off.



THE NEW 75 KW THERMEX CORE BAKER
(with the Tunnel Circuit)

See it at the Show!
SPACES 1236–1347–1349

The GIRDLER Company

A DIVISION OF NATIONAL CYLINDER GAS COMPANY
THERMEX DIVISION
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Meet me in Cleveland*

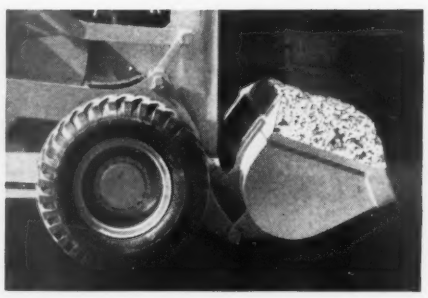
(or if you can't come, write)

To cut the cost of bulk material handling in your foundry, I'll show you why I lift a bigger load, turn shorter, carry faster and reach higher and farther than any other 12 cu. ft. tractor shovel built today.

* Make a note to see a demonstration at Booth 1345 at the Foundry Show. Or send for Specification L12-4S and name of distributor who sells and services Load-Plus in your city.

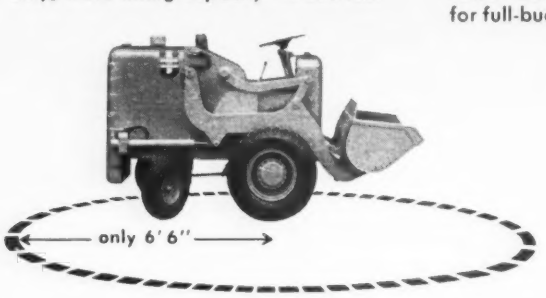
JAEGER LOAD-PLUS

20% more lifting capacity—1200 lbs.



Lower bucket level position available for full-bucket loading, better carrying.

Higher dumping clearance of 4'6"; under hinge 6'8". Longer reach of 2'7".



5" shorter turning radius and faster speeds to 13.88 mph in reverse, 7.66 forward.

For bigger work, 1 cu. yd. model, equipped with torque converter and power steering, provides fast, low-cost handling of bulk loads up to 5000 lbs.

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AIR COMPRESSORS • PUMPS • MIXERS • PAVING MACHINES

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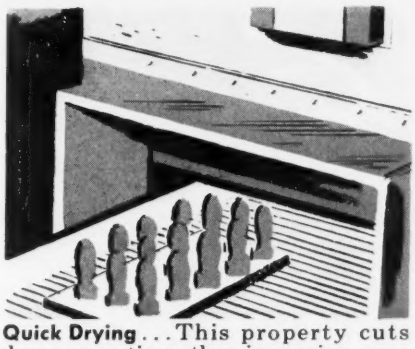
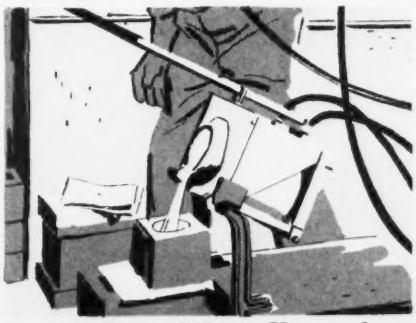
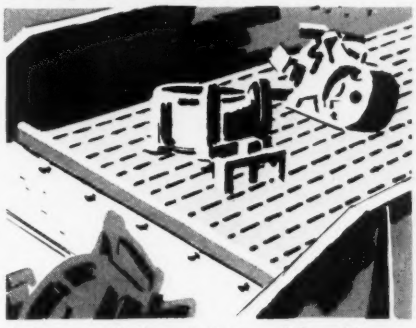
Superior Green Strength... Mogul-bonded cores maintain shape and dimension throughout handling and storage.



Quick Drying... This property cuts down oven time, thus increasing oven capacity.



Excellent Permeability... You reduce costly "blows" and casting loses due to inadequate venting.



Adequate Collapsibility... Mogul burns out at just the proper instant, eliminating strains and hot-tears.

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Specially developed to meet today's needs for greater efficiency. Mogul Corn Cereal Binders are unique in the industry. Carefully controlled, modern wet-milling processes produce a uniform product. Because of its bonding power in the wet state, Mogul Binder yields a core of great sag resistance and dimensional stability.

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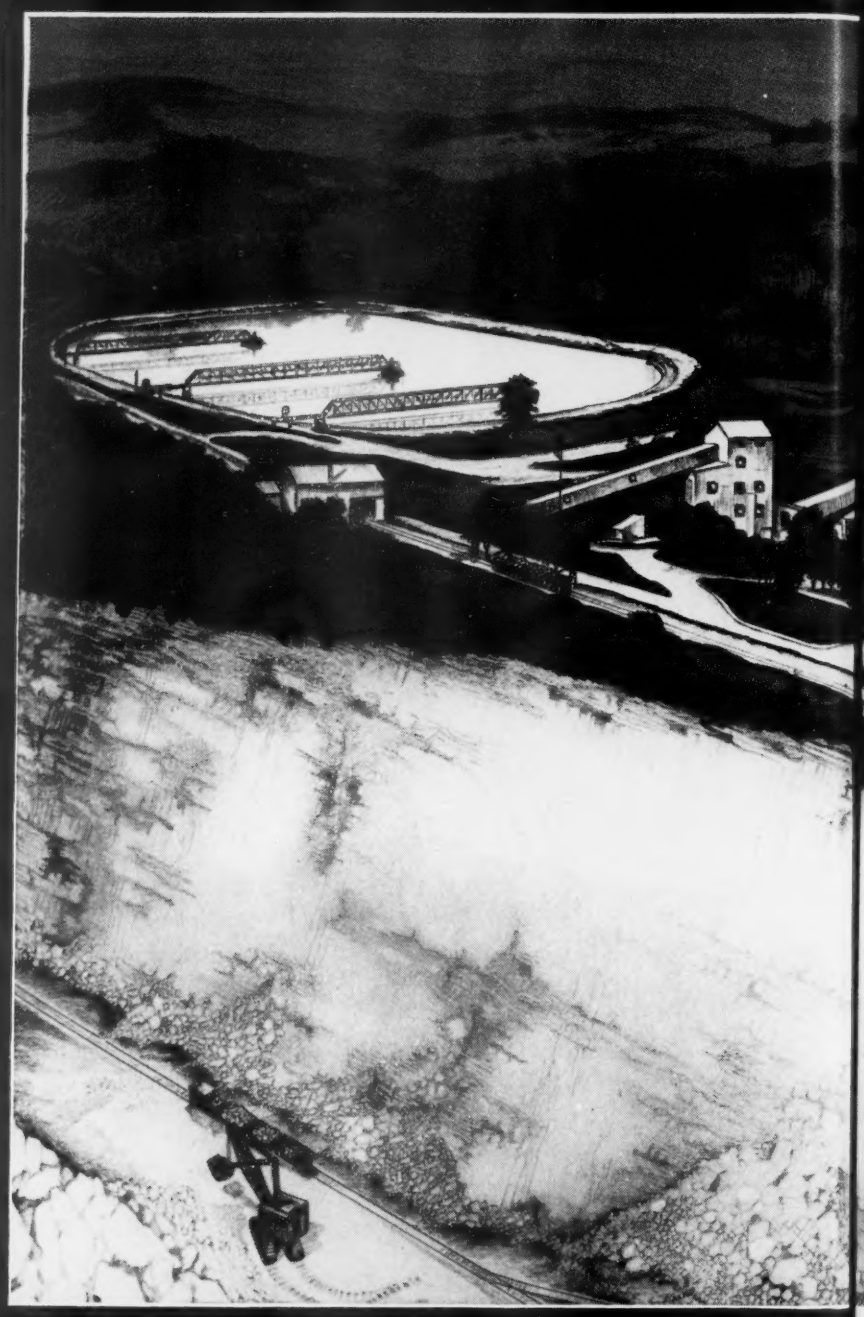

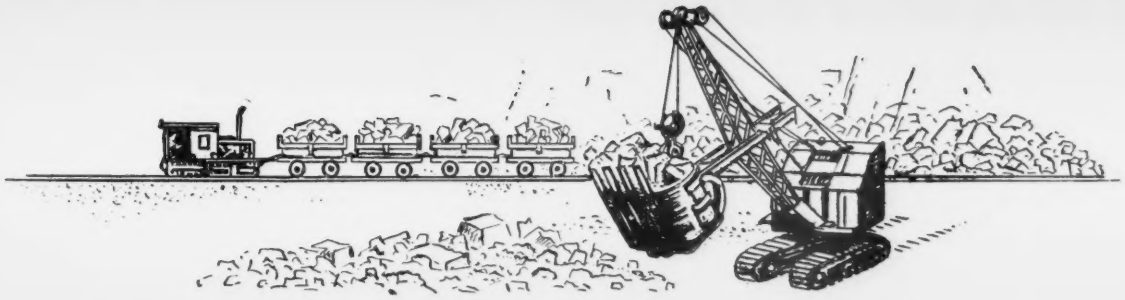

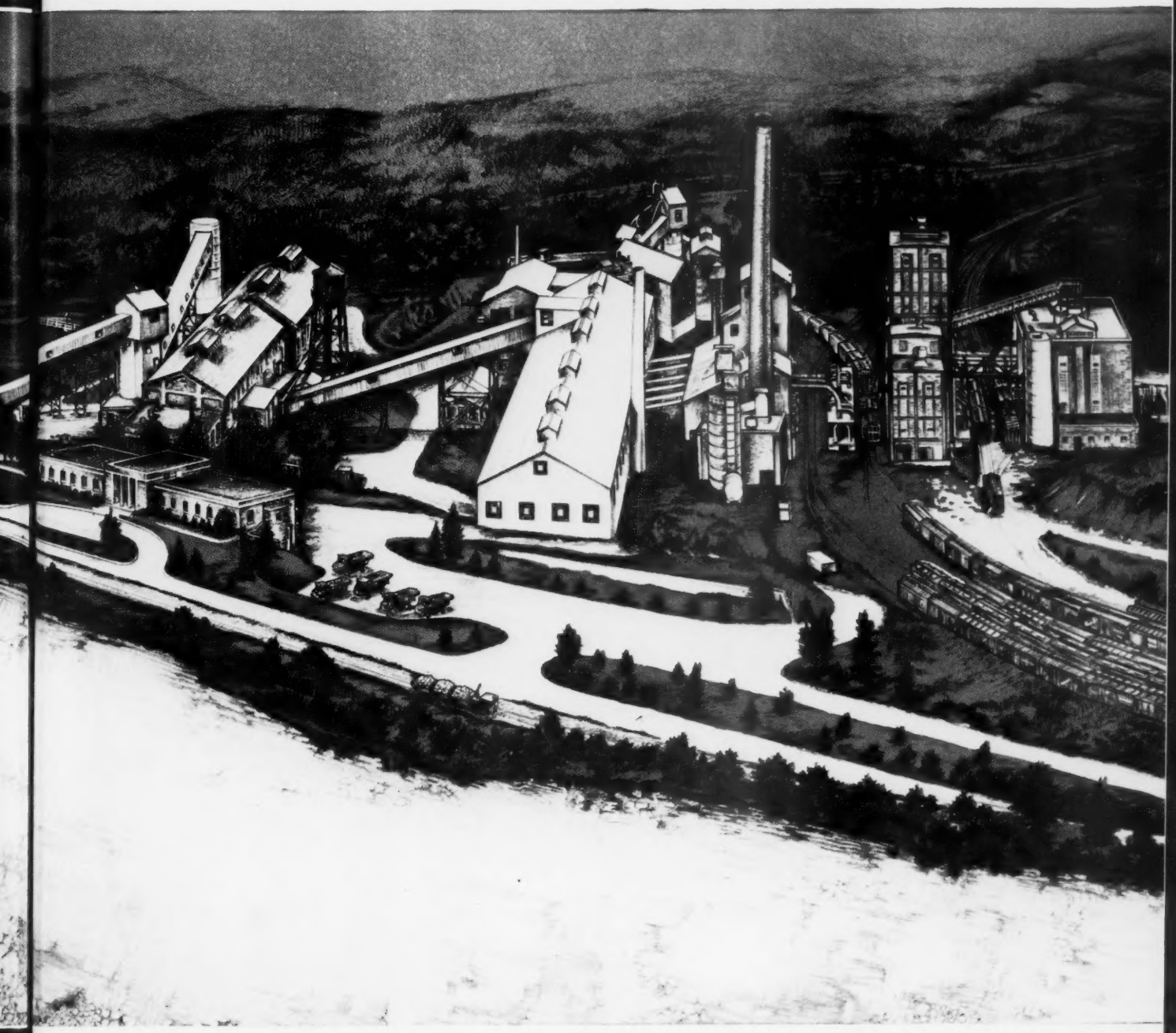

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SANDCUTTER'S *whirling blades help beat the cost spiral*

Never A Mirage* On This Desert of Sand

**For 46 years—in thousands of foundries SANDCUTTER has been the low-cost method of getting a quality-conditioned sand.*

Quality and economy are no illusory mirage on the deserts of sand on foundry molding floors across the nation where the whirling blades of a Sandcutter are providing profitable sand conditioning.

Sandcutter conditioned sand is infinitely better than that cut by hand. It riddles fast, rams easily and vents perfectly. Sand such as this is bound to result in a better, more uniform casting and reduce scrap losses to a minimum!

With a Sandcutter on the job you can be sure of lower unit costs, too, through savings all along the line; fewer man-hours for sand conditioning, less time required for grinding, cleaning and inspection, less labor turnover and increased production.

Since 1908 more than 1500 Sandcutters have been installed in jobbing and production shops of every type. As an investment in profitable sand conditioning they are hard to beat. They pay dividends for many years—many are still in operation today that are 20 and 25 years old—and they are still going strong.

Save manpower — step up the whole efficiency of your foundry with a Sandcutter. There's a size and type to meet your needs. Write for literature today.

Write today for catalog No. 25-A describing the Sandcutter for cutting average size floors.

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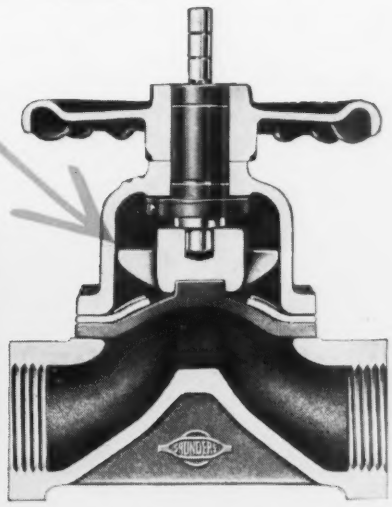
THE IDEAL VALVE FOR FOUNDRY USE



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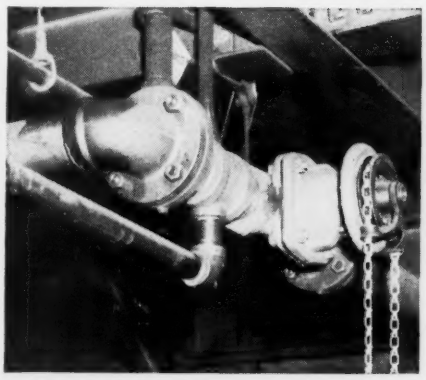
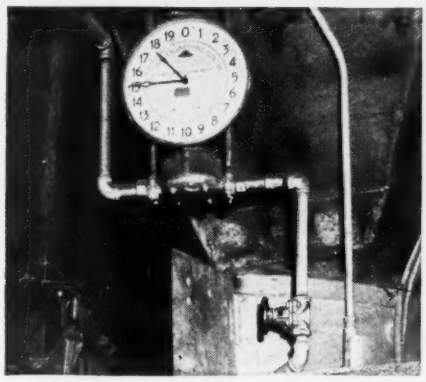
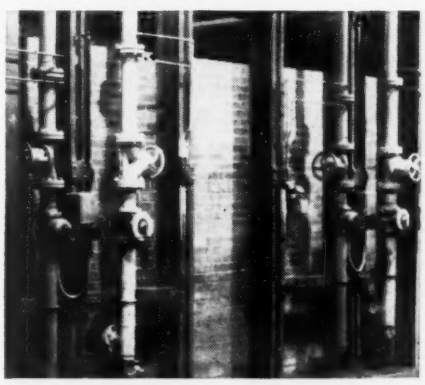
AIR...
WATER...
GAS!



COMPRESSED AIR — Chain wheel operated Grinnell-Saunders Diaphragm Valve on an elevated main air line to molding stations.



WATER — Grinnell-Saunders Diaphragm Valve on precision water metering line to molding sand muller in foundry.



GAS — Grinnell-Saunders Diaphragm Valves handling producer gas for annealing furnaces.

GRINNELL-SAUNDERS DIAPHRAGM VALVES

Credit the flexible, easy-to-replace diaphragm with providing important advantages. The diaphragm lifts high for streamlined passage, in either direction; closes tightly for an absolute seal, even when scale lodges on the valve weir.

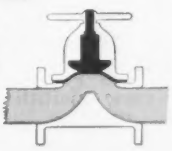
That feature alone can mean impressive savings. For a *single* leak in a valve on an air line, even as tiny as 1/32-inch, can waste in one month's time, the equivalent of the cost of a new Grinnell-Saunders Diaphragm Valve.

Grinnell-Saunders Diaphragm Valves offer other advantages, too. Bodies, linings, and diaphragm materials are available to meet most service conditions. The only part that ever needs replacing is the diaphragm, which can be changed in minutes without removing the valve body from the line. In downtime and overtime saved — in maintenance and repair work avoided — you are dollars ahead when you rely on Grinnell-Saunders Valves.

Grinnell-Saunders Diaphragm Valves, packed in cartons, are stocked by Grinnell branch warehouses and distributors from coast to coast. Write for Grinnell-Saunders Diaphragm Valve catalog.

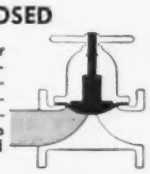
OPEN

No packing glands to demand attention. Working parts are isolated from fluid . . . sticking, clogging, contamination, corrosion eliminated.



CLOSED

Compressor or finger plate supports the diaphragm in all positions. No metal-to-metal seats to become damaged or wire-drawn.

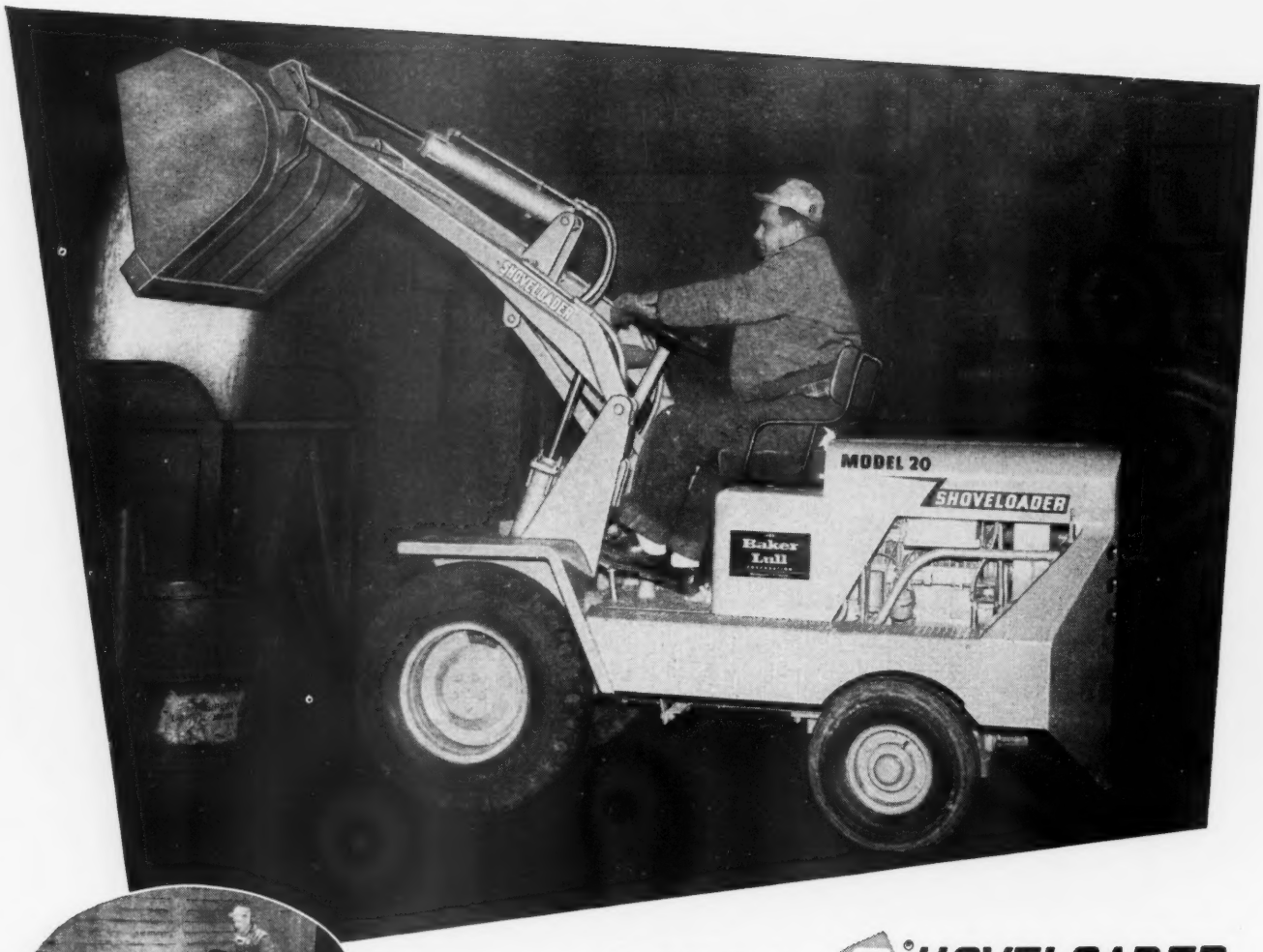


GRINNELL

WHENEVER PIPING IS INVOLVED

Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems



Rugged NEW SHOVELOADER mechanizes bulk handling for only $3395.00*

For LESS than $10.00 a day for one year . . . much less than you pay a laborer with a hand shovel . . . you can own a Baker-Lull 12 cubic foot SHOVELOADER. And you get a lot more for the money!

Check all of these features and see why this SHOVELOADER compares with others costing $350 to $400 more. The lift height is a tall seven feet with lifting capacity a husky 1500 pounds . . . 500 pounds more than most competitive units. The loader arms are located out in front of the operator—not around him—to keep him safe from injury and give him clear-view visibility at all times. The bucket can be cradled low too, giving him unobstructed forward visibility and making it unnecessary to drive backward as with other units. Maximum travel speed is 14 MPH. Plenty of bucket tilt back at ground level makes it easy to get a full bucket every time from stockpiles . . . letting you reduce handling costs by moving more bulk in a shorter time.

Attachments let you do more types of work too. Lift forks let you handle palletized loads, the crane hook gives you a portable hoist, and special buckets are available for handling dense materials. Exhaust-destroying catalytic equipment is also available for indoor use where necessary.

Baker-Lull SHOVELOADERS are available in sizes ranging from 12 cubic feet to 1½ cubic yards four wheel drive. Should you desire information on other sizes please specify when writing. The BAKER-LULL Corporation, 325 West 90th Street, Minneapolis 20, Minn.

*F.O.B. Minneapolis

THE BAKER-LULL CORPORATION,
325 West 90th Street • Minneapolis 20, Minn.

Please send full information on the Baker-Lull, Model 20, 12 cu. ft. SHOVELOADER which sells for only $3395.00.

NAME.....

COMPANY.....

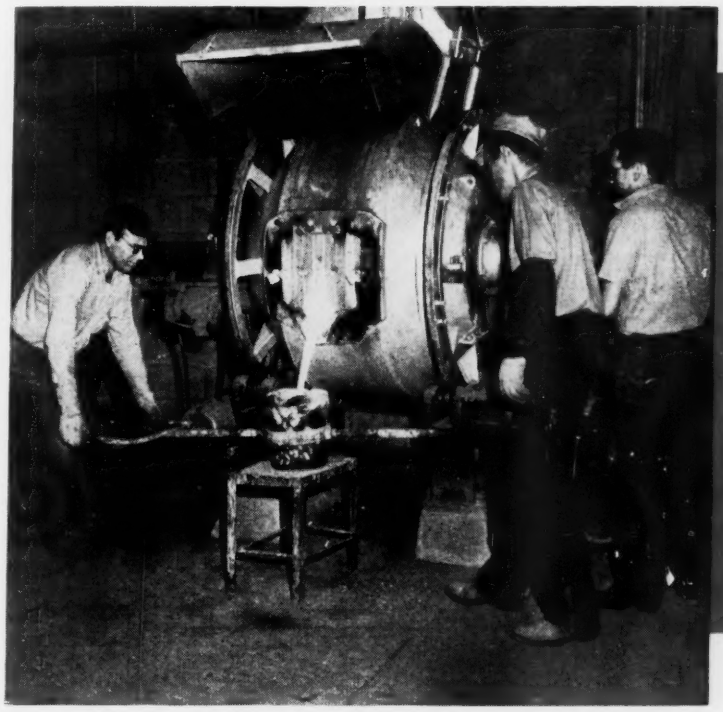
ADDRESS.....

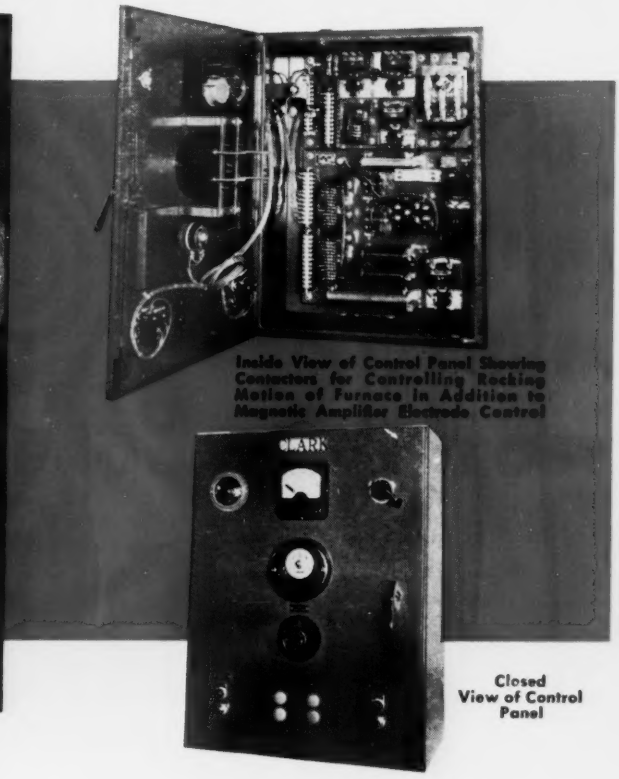
CITY.....STATE.....

Baker Lull handling equipment

SHOVELOADER

CLARK MAGNETIC AMPLIFIER CONTROL





Inside View of Control Panel Showing Contactors for Controlling Rocking Motion of Furnace in Addition to Magnetic Amplifier Electrode Control

Closed View of Control Panel

...reduces melting time and power consumption

of DETROIT Rocking ELECTRIC FURNACE

The control problem in this electric furnace is that of continually adjusting the arc gap between two electrodes to maintain constant power input for the melt. This is done automatically by a CLARK-engineered control using a Magnetic Amplifier to position a movable electrode at a speed determined by deviation from the desired setting.

Because the CLARK Magnetic Amplifier is affected instantly by the slightest current variation, it causes the electrode-positioning motor to react quickly and regulate arc gap to hold furnace heat within very close limits. Maintaining the desired heat input substantially reduces melting time, power consumed per melt, and danger of damage to refractory and other furnace parts from overheating.

Since the Magnetic Amplifier has no tubes, there is no "warm-up" delay. Having no moving parts, it is virtually maintenance-free.

The CLARK Magnetic Amplifier Control can be applied to direct and indirect arc furnaces, as well as countless other industrial applications for regulating speed, voltage, current, precise positioning, etc. It does this automatically within close limits, from a minute input signal.

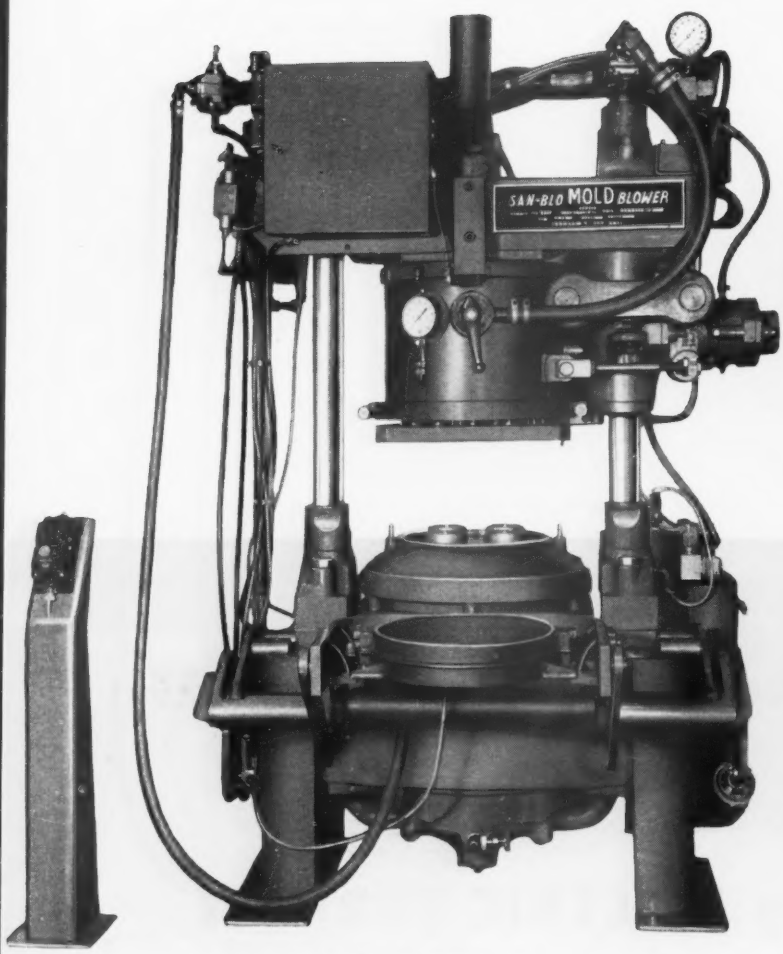
See this Furnace and Control in Operation in the Detroit Electric Furnace Booth 1126 at the Foundry Show.

The CLARK CONTROLLER *Company*

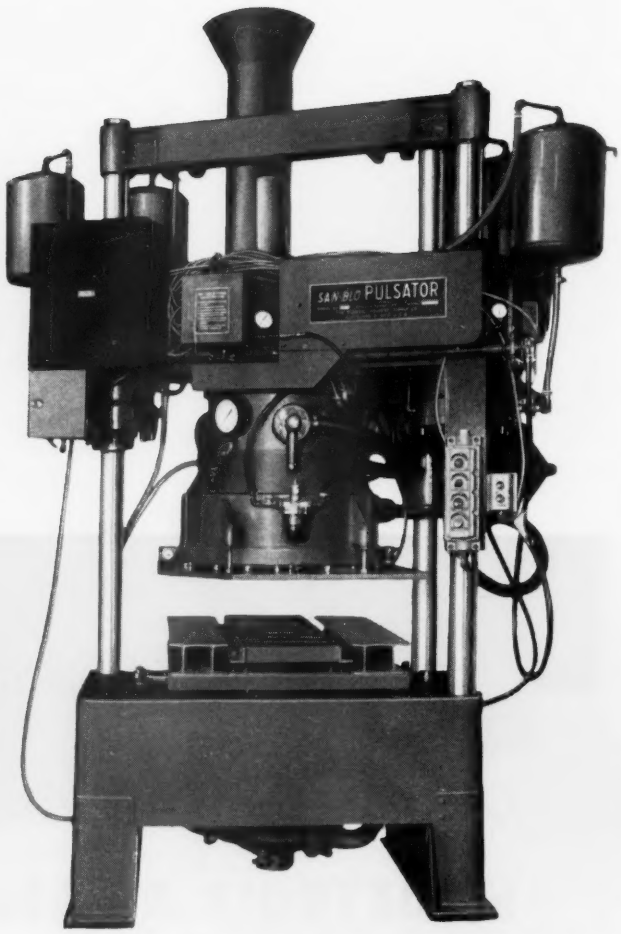
Engineered Electrical Control

1146 East 152nd Street • • Cleveland 10, Ohio

sooner or later . . .Y



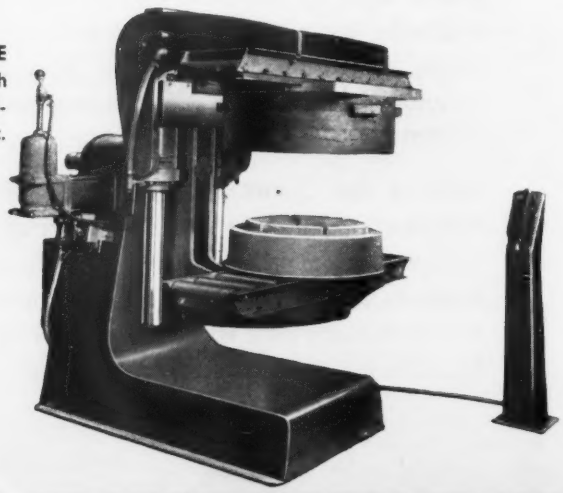
Model 150 MOLD BLOWER—Blows cope, drag or stack molds. Prefill—blow—squeeze action. Fully automatic, including handling of flask in and out of machine.

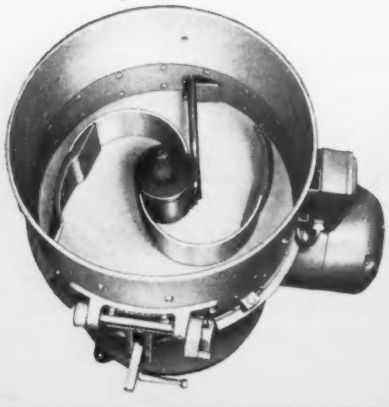


Model 250P-LPP CORE BLOWER—Blows cores from 5 to 250 lbs., in wooden or metal core boxes. Completely automatic.

FIND OUT ABOUT "CYCLO-AIR" • "LPP" • "PULSATION"

ROLLOVER-DRAW MACHINE
Specially designed for high production with the SAN-BLO "250". Fully automatic.



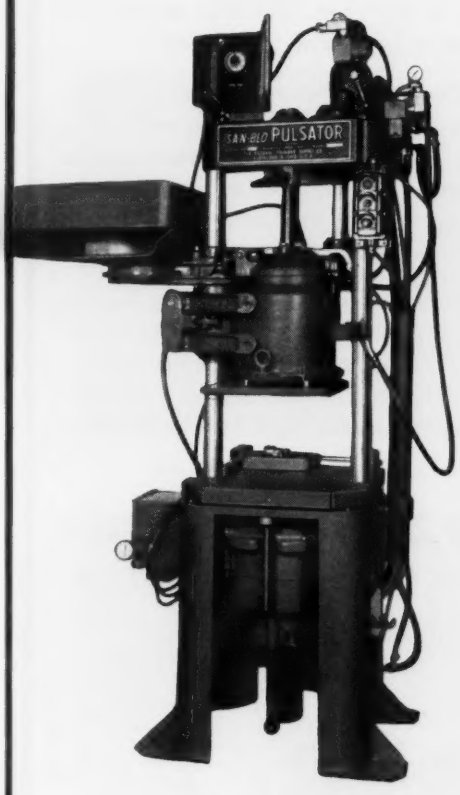


WHIRLMIX SAND MIXER
Flexible, spring steel arms mix sand thoroughly and quickly, without crushing or heating.

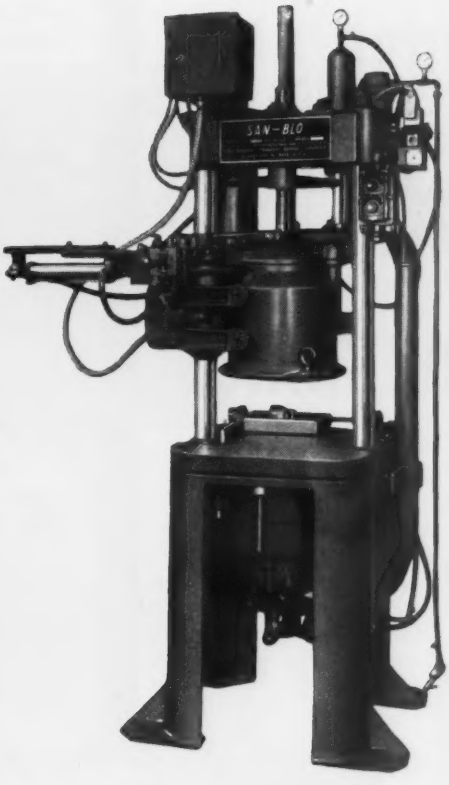
BOOTH NO. 1012-1111

...YOU'LL NEED A SAN-BLO

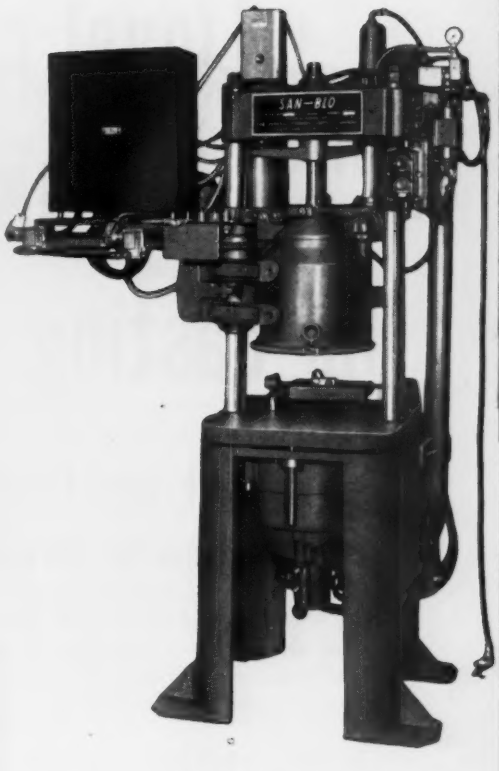
. . . SO, AT THE FOUNDRY SHOW, SEE THESE EXTRAORDINARY MACHINES IN OPERATION—LEARN WHY THEY'LL SLASH YOUR PRODUCTION COSTS.



Model 40-P-1 CORE BLOWER
For jobbing foundries. Blows cores weighing up to 40 lbs., in wooden or metal core boxes.



Model 40-D-4 CORE BLOWER
For production foundries. Cores up to 40 lbs., in metal boxes. Electrically timed blowing cycle.



Model 40-D-9 CORE BLOWER
Completely automatic, for high-speed production of cores up to 40 lbs., in metal boxes.

FEDERAL

MEMBER FEMA FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION, INC.

The **FEDERAL FOUNDRY SUPPLY** *Company*

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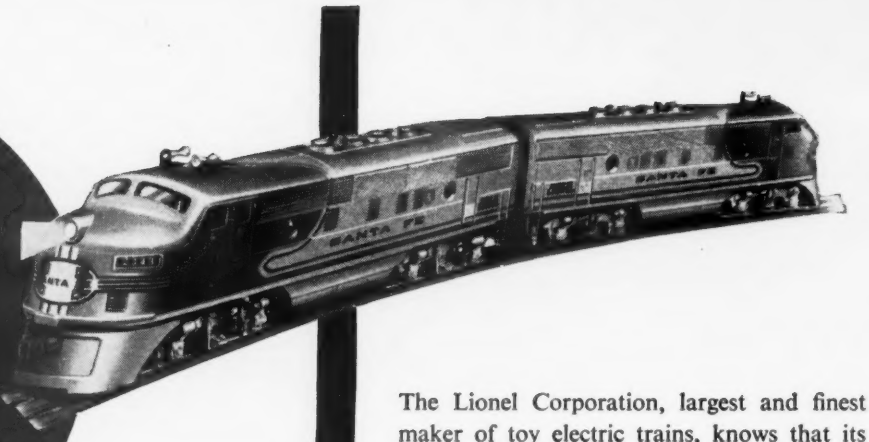
CHATTANOOGA · CHICAGO · DETROIT · LOS ANGELES · MILWAUKEE · NEW YORK

EUROPEAN REPRESENTATIVE: SA. PH. BONVILLAIN & E. RONCERAY. Rue Paul-Carle a Choisy-Le-Roi, Seine, France.

Beautiful— but tough to build...so



Lionel chose Kux Die casting machines

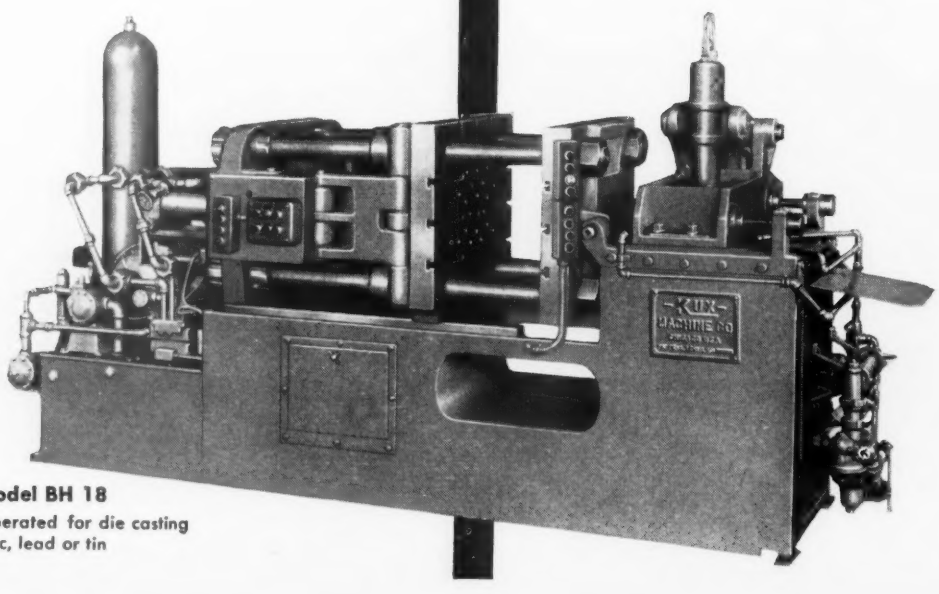
to get perfect detail in its scale model trains

The Lionel Corporation, largest and finest maker of toy electric trains, knows that its customers require exactness of detail from gear boxes to the colors in the insignias of famous trains it reproduces. Much of this detail is possible only because of the perfection obtained by the use of die cast parts made on KUX machines. Lionel finishes must match those of the real life counterpart to the minutest detail . . . they have to be tough and durable enough to withstand the knocks of railroads operated by boys from "six to sixty."

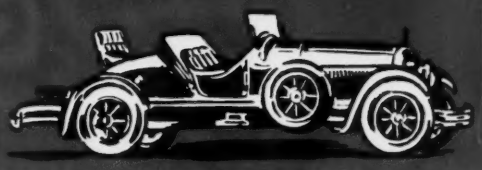
KUX Die Casting Machines produce tough, smooth, non-porous castings that make these finishes possible. They add strength to the trains, provide superior performance, and permit an economy of production so Lionel can sell its products at the lowest possible price.

KUX engineers can help you solve equally tough production problems with exactly the right machine to meet your requirements . . . whether it's tiny gear boxes or gigantic castings. A letter or card will bring you full information.

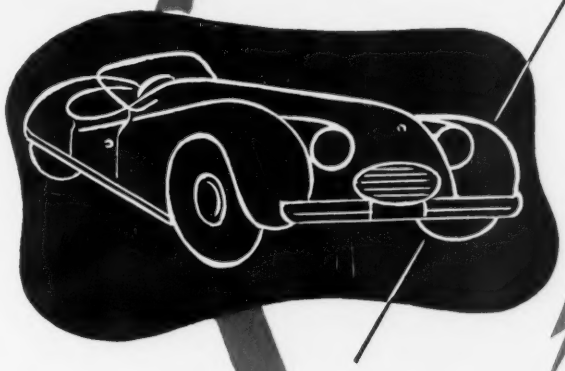
KUX MACHINE COMPANY
6725 N. Ridge Ave. • Chicago 26, Ill.



Model BH 18
Hydraulic operated for die casting zinc, lead or tin

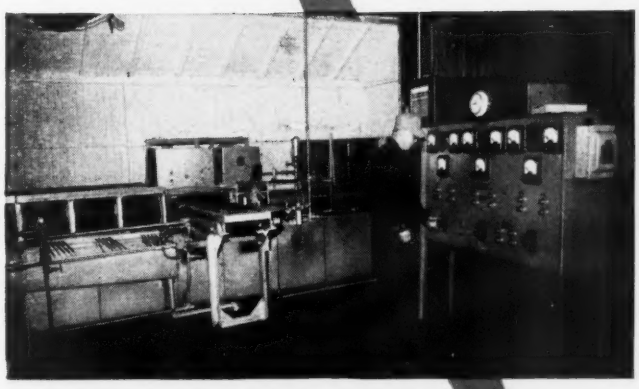


Other TIMES Other METHODS...



Today it's GECO INDUCTION

FOR THE NEWEST IN FORGING AND HEAT TREATING EQUIPMENT



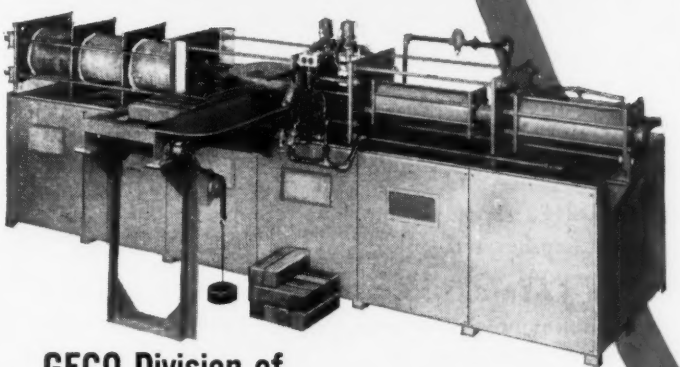
1200 KW Billet Heater and Control Panel.

Today's production methods require modern, low-cost, efficient equipment. For instance — a Morrison-Geco user writes as follows:

"Prior to the installation of Morrison-Geco dual frequency induction heating equipment, we used a fuel-fired furnace to heat billets prior to forging. The cost of fuel was 18.14¢ per billet. Now we heat billets at a cost of 8.15¢ per billet, on an 8½ hour shift per day. In addition to saving about 10¢ per billet, there is a saving of 1.73 pounds of steel per billet, which amounts to 12.85¢ per billet. There is also a further saving in personnel, since our induction heating installation requires 5 less operators than the fuel-fired furnace.

"Three fuel-fired furnaces were formerly used to heat shells prior to nosing. Cost of the fuel was 5.95¢ per shell, and the operation required a staff of six men. Using Morrison-Geco induction heating equipment, the cost of electricity is 4.25¢ per shell, with only four men required."

Want additional facts, figures, and details? Write us today and learn how your plant operations can be improved with Morrison-Geco low-frequency induction heating equipment.



1200 KW Steel Billet Heater — Dual Frequency. A Steel Billet is supplied every 22 sec. at 2200° F.

GECO Division of

MORRISON ENGINEERING CORPORATION

MORRISON ENGINEERED

30010 Lakeland Blvd.
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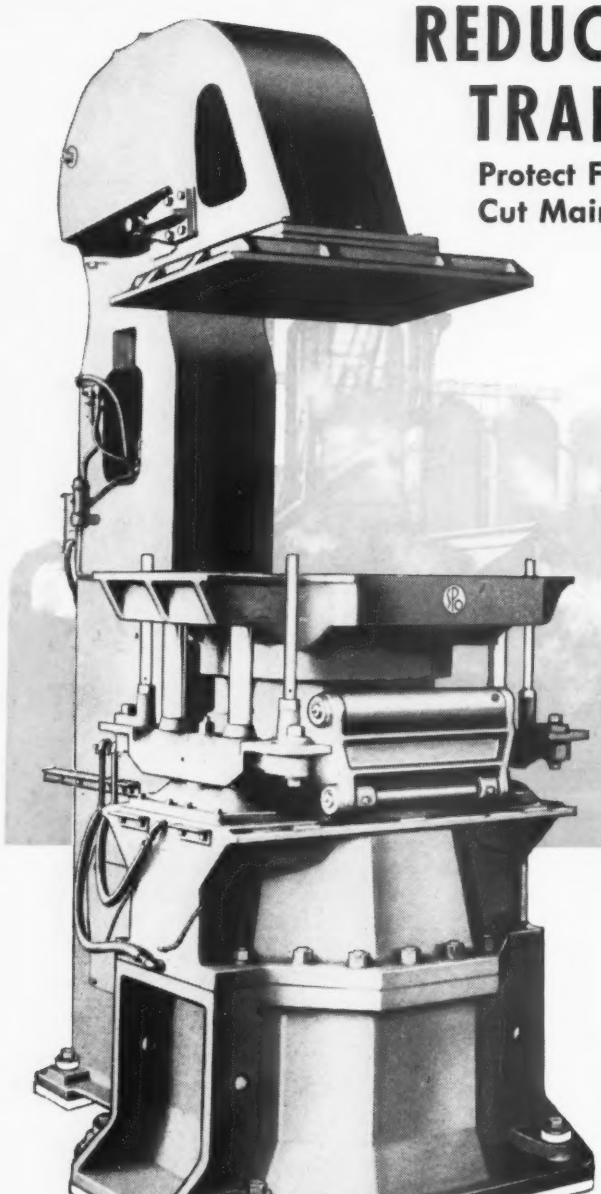
DESIGNERS AND BUILDERS OF INDUSTRIAL FURNACES AND OVENS

CLEVELAND, OHIO *Associate Companies:* GENERAL ENGINEERING CO., LTD., TORONTO, CANADA
BRITISH-GECO ENGINEERING CO., LTD., LONDON, ENGLAND · SOCIÉTÉ MANGIN, PARIS, FRANCE

FABREEKA *Pads*

REDUCE IMPACT SHOCK and TRANSMITTED VIBRATION

Protect Foundations and Machines
Cut Maintenance Costs and Improve Production



For severest service under heavy loadings, it pays to specify FABREEKA Pads, proven by over 18 years successful performance.

Some of the Many Applications of
FABREEKA PADS
IN THE STEEL INDUSTRY

STEEL PLANTS—Traveling Bridge Cranes, Ore Bridges, Ingot Trucks and Buggies, Skip Hoists, Transfer Cars, Pusher Tracks.

FORGING AND STAMPING—Forging Hammers, Hydraulic Presses, Stamping Presses.

FOUNDRIES—Molding Machines, Shakeout Machines, Tumbling Barrels.

METAL FABRICATING—Punch Presses, Shears, Broaches, Grinders, Milling Machines, Planers, Swedging Machines.

VISIT BOOTH 1234, Foundrymen's Show, Upper Lake Side Hall, Cleveland Auditorium, MAY 8-14

FABREEKA PRODUCTS COMPANY, INC.

222-B Summer Street, Boston 10, Massachusetts

NEW YORK CHICAGO DETROIT SPARTANBURG PHILADELPHIA PITTSBURGH OAKLAND

You Get Greater Flexibility Without Costly Installations When You MECHANIZE MATERIALS HANDLING With Tractor Shovels

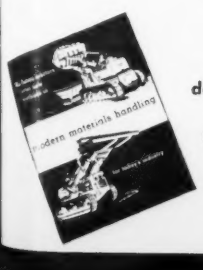
When you put an Allis-Chalmers Tractor Shovel to work around your plant, it starts paying its way immediately. There is no down time for installation or costly plant alteration . . . no long training course for the operator. What's more, this one-operator machine not only saves many man hours, it gives you the benefit of several specialized units in one.

As Materials Handlers, Allis-Chalmers Tractor Shovels, with capacities from one to four cubic yards, pick up and carry all types of bulk, solid or packaged loads and deliver them anywhere in or around the plant. Storage areas may be changed at will. Special attachments — Lift Forks, Rock Forks, Bulldozers and Angledozers plus many others for some models — may be interchanged with the bucket in about 20 minutes.

As Prime Movers, these powerful crawler tractors can pull, lift or skid heavy machinery, spot railroad cars at loading docks. Traction and flotation enable these machines to work in snow or mud where wheel-mounted equipment bogs down.

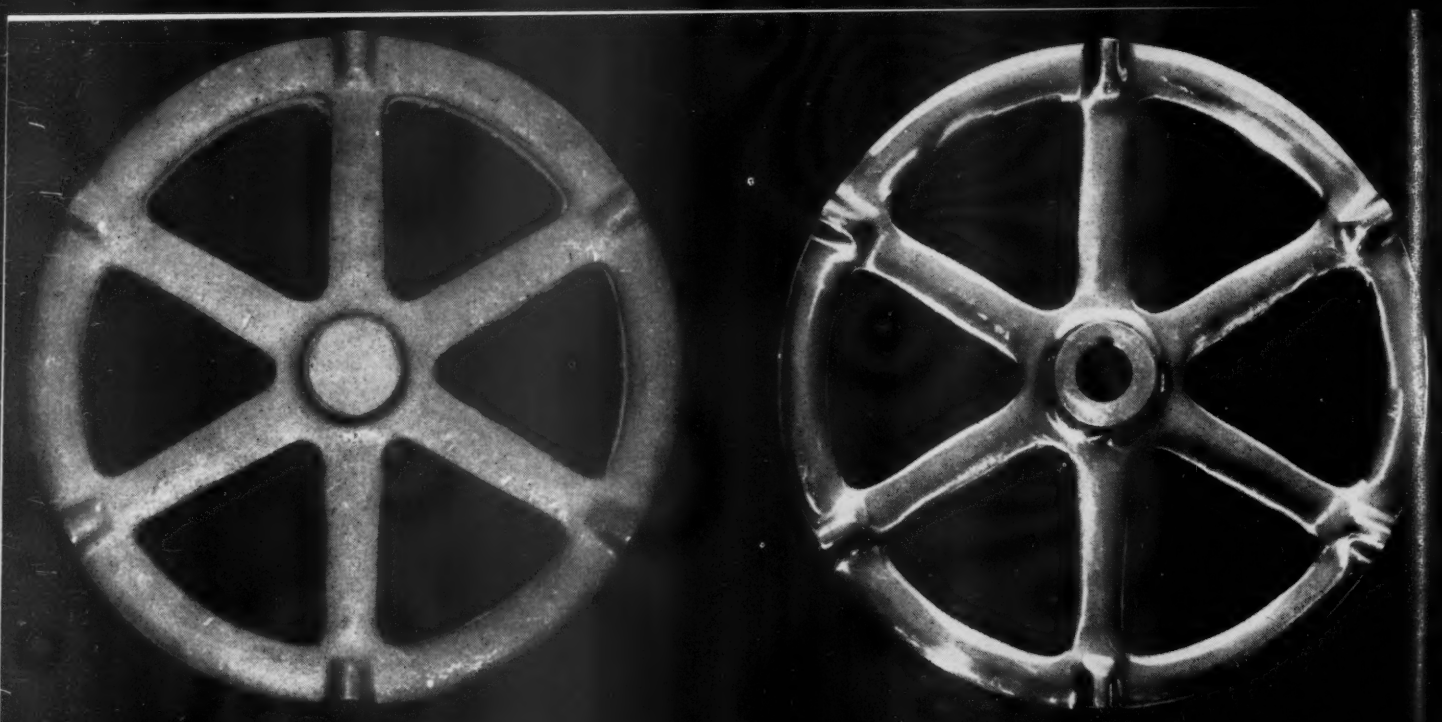
As Maintenance and Construction Machines, Allis-Chalmers Tractor Shovels handle general clean-up work around the plant, build plant roads, excavate for new construction, clear snow . . . keep busy repaying your investment winter and summer.

Ask your Allis-Chalmers dealer to show you how the versatile Tractor Shovel is helping cut costs for thousands of owners. There are four sizes to fit your needs from the one-yard HD-5G to the four-yard HD-20G with torque converter drive.

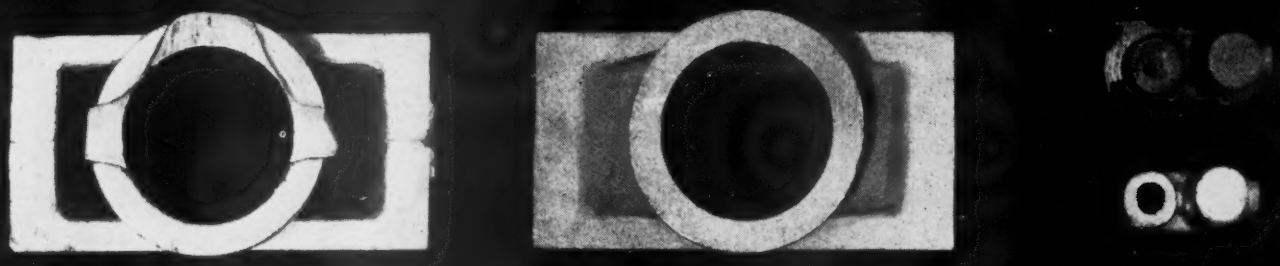


Write for catalog describing the use of tractors in modern materials handling.

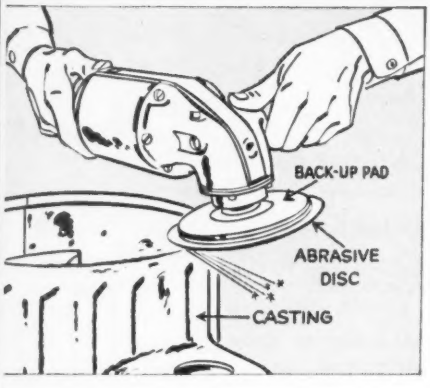
ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

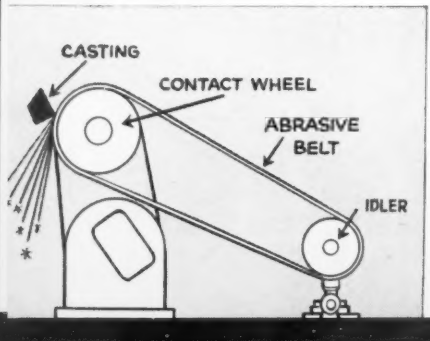


BRONZE marine steering wheel . . . before and after finishing by one of the Three-M-ite line of belts.



ALUMINUM adapter for the aircraft industry. A Three-M-ite type belt gives these parts a smooth, even finish.





Belts & Discs grind non-fe

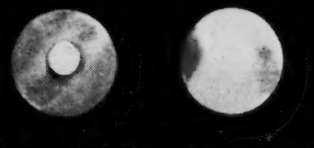
3M Method gives you these advantages: • Consistently bette

Yes, 3M Coated Abrasives will assure a better, more consistent finish on your non-ferrous castings than any other grinding method. 3M Abrasive Belts and Discs are fast-cutting and they're safe . . . production is increased with less operator fatigue.

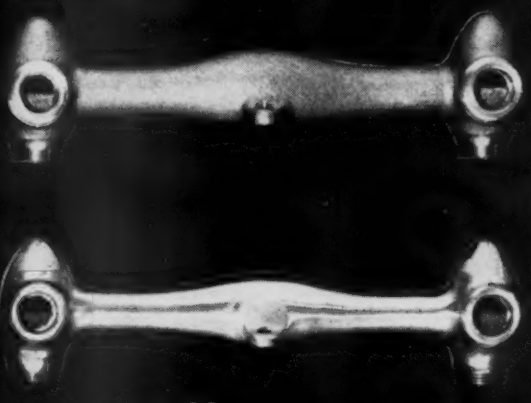
The reason for these outstanding results is the superior quality of 3M Coated Abrasives which give you a uniform cutting surface . . . a cooler running operation . . . a faster rate of cut than was ever possible before by any other method.

Call in your 3M Representative. He's an expert on coated abrasives who can suggest time and cost saving ways to put 3M Abrasives to work *for you*. He'll

DIAGRAM ABOVE shows how a 3M Abrasive Disc is used to grind a big casting. This method is often used for castings too large or heavy to be brought to a Backstand Grinder (shown at left). The Backstand Method uses 3M Abrasive Belts running over an idler and over a contact wheel installed on your present lathe



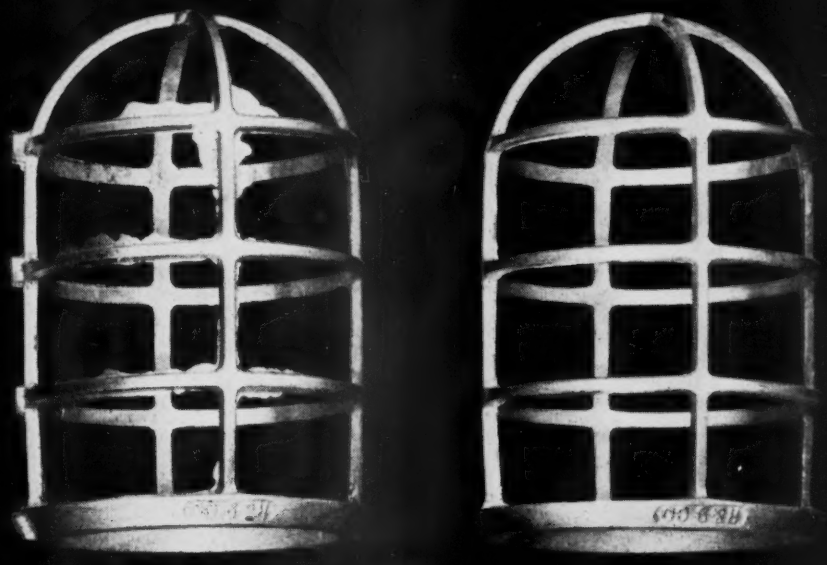
MANGANESE bronze aircraft engine part, before and after grinding with a Three-M-ite type belt.



BRASS acorn faucets before and after grinding with a Wetordry type belt.

MAGNESIUM steering wheel column bracket for automobiles. Ground by a Three-M-ite type belt.

BRONZE Before and after pictures of a bronze vent tube shroud for portable chain saws show smooth finish obtained by a Three-M-ite type belt.



ALUMINUM light guard before and after grinding with a 3M Type "C" Disc.

n-ferrous castings better, faster!

y better finish • Increased production • Greater safety • Less operator fatigue

survey your operation—suggest the *right* abrasive to improve finishes and increase production in your foundry. Send coupon today for facts. Of course, there's no cost or obligation.

★ ★ ★

Details of grinding non-ferrous castings pictured here, will appear in forthcoming issues of FOUNDRY magazine.

3M ABRASIVES

FREE BOOKLET!

MINNESOTA MINING AND MFG. CO.
DEPT. F-54, ST. PAUL 6, MINN.

☐ Send me free booklet
☐ I'd like to talk to a 3M Representative

NAME _____ TITLE _____

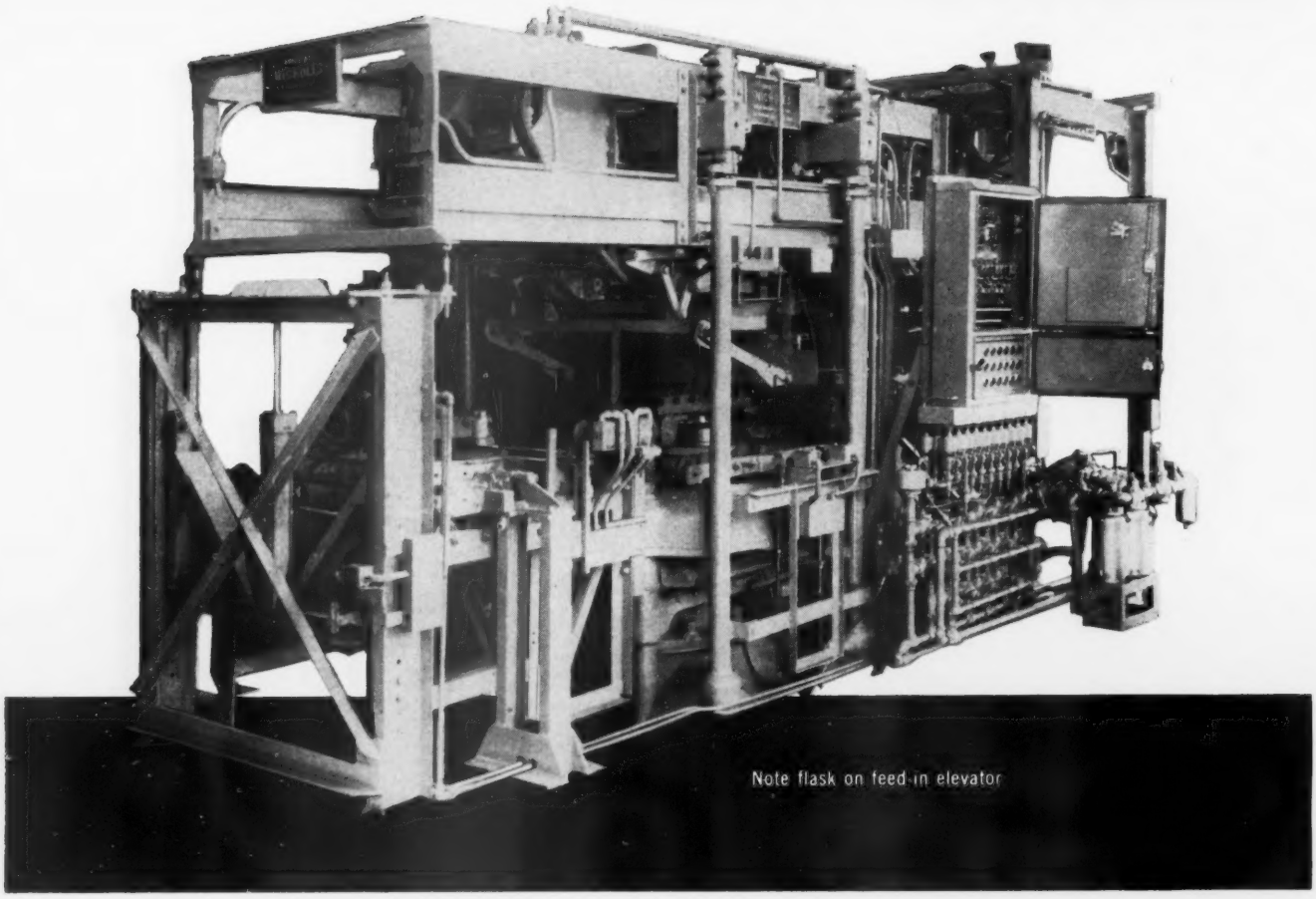
COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Made in U.S.A. by Minnesota Mining and Manufacturing Company. General Offices: St. Paul 6, Minn. In Canada: London, Ont., Can. Export: 122 E. 42nd St., New York City. Makers of "Scotch" Pressure-Sensitive Tapes, "Scotch" Sound Recording Tape, "3M" Adhesives, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-slip Surfacing.

Do You Want ▶ Increased Production ▶ Lower Costs



Note flask on feed-in elevator

"Push Button" AUTOMATIC

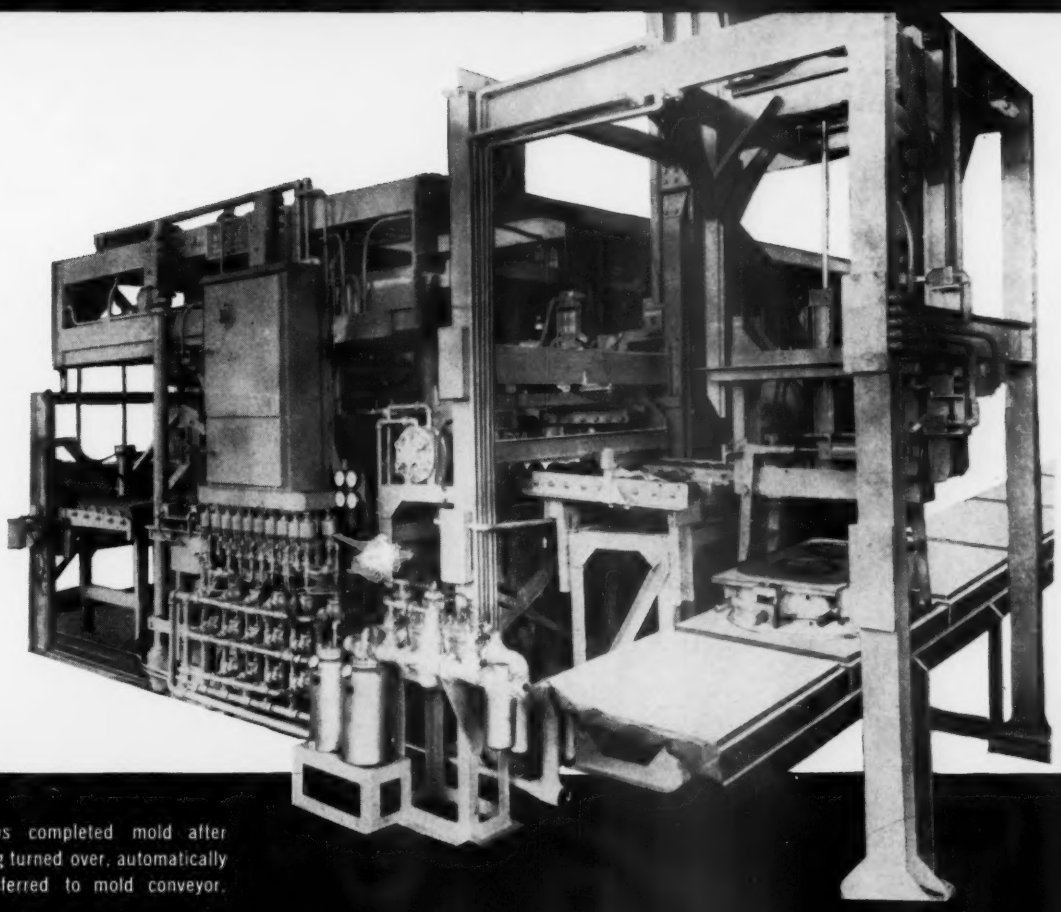
Here's the ultimate in heavy duty molding machines. The new #24 Type C machine has everything you've ever looked for in foundry equipment...

- **Pneumatic Pattern Draw**
- **Air-Operated Car Type Squeeze Head**
- **Built-in Flask Roll-In, Roll-Out Device**
- **Measuring Sand Hopper**
- **Flask Feed-In Elevator**
- **Flask Indexing Device and Sand Spill Upset**
- **Mold Turnover and Transfer**

Always rely on "Nicholls" for the best

NICHOLLS

Consistently Higher Quality Molds?



Shows completed mold after being turned over, automatically transferred to mold conveyor.

OPERATION GIVES THEM ALL TO YOU!

See This Machine on Exhibit at Booth No. 1416

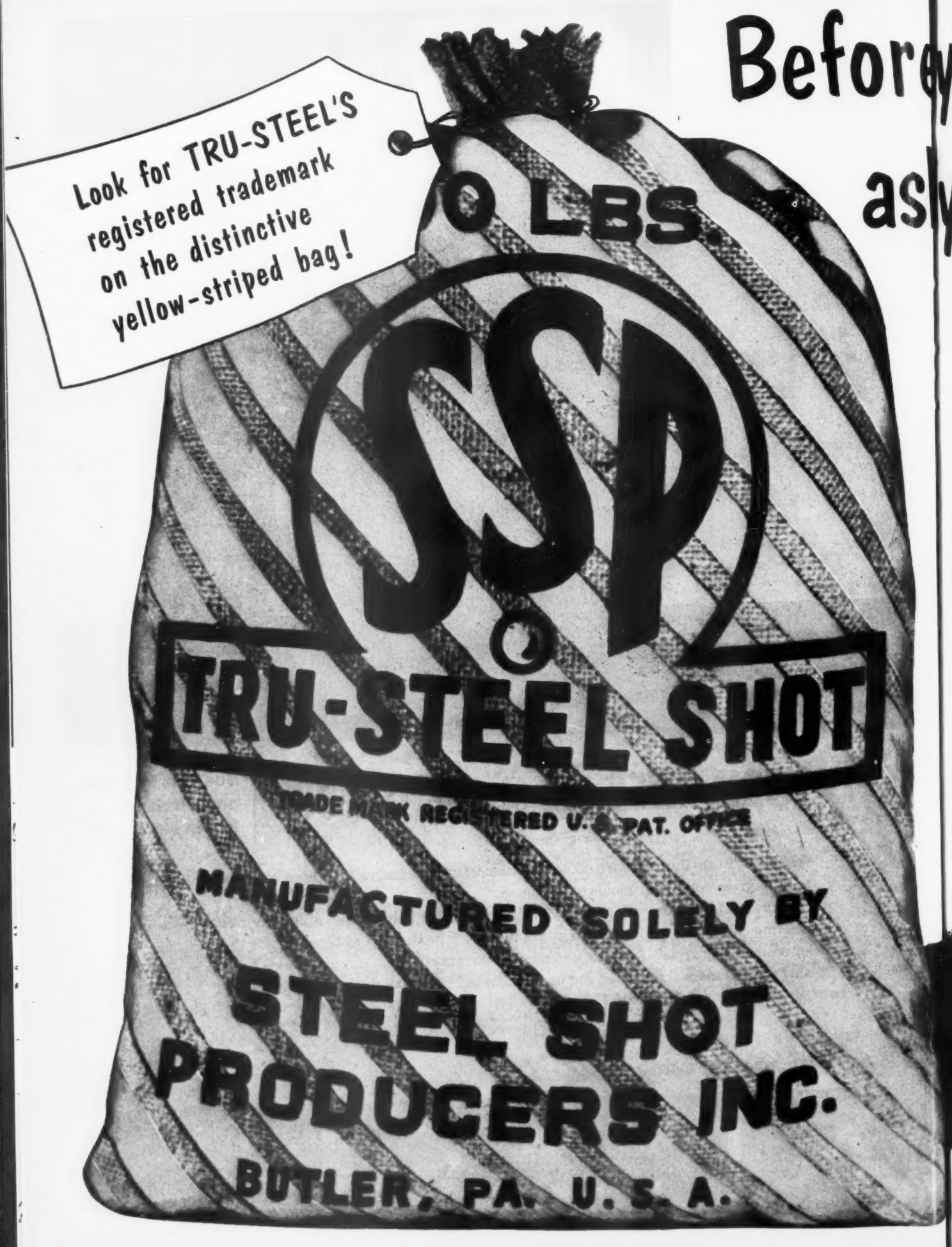
AND . . . "Push-Button" AUTOMATIC OPERATION which eliminates dangerous risks, costly mistakes — gives you better molds *continuously*.

Nicholls Heavy Duty Molding Machines are the result of half a century's experience in building equipment engineered to insure the faster production of better molds at consistently lower operating costs. If you're interested in increased profits through major savings in materials and maintenance costs, write us for complete information.

WM. H. NICHOLLS CO., INC., Richmond Hill 18, Long Island, N. Y.

in heavy-duty molding machines

NICHOLLS


Look for TRU-STEEL'S registered trademark on the distinctive yellow-striped bag!
LBS.
SSP
TRU-STEEL SHOT
TRADE MARK REGISTERED U.S. PAT. OFFICE
MANUFACTURED SOLELY BY
STEEL SHOT PRODUCERS INC.
BUTLER, PA. U.S.A.

you buy any steel shot, yourself these questions

1 What type of steel shot *will do the best cleaning job—fastest?*

High-carbon steel shot because it has the proper hardness for fast, thorough cleaning. TRU-STEEL is the original *high-carbon* steel shot of tool steel quality—chemical analysis exactly controlled.

2 What type of steel shot *will last the longest in service?*

Steel shot need not be of low hardness to provide maximum wear. TRU-STEEL's high-carbon chemistry responds to scientific and accurately controlled heat-treating *and drawing* to provide maximum toughness and unequalled service life.

3 What type of steel shot will give the *lowest blast-cleaning costs?*

Any one steel shot that has the combination of (1) and (2) *plus* lowest first cost from the manufacturer. ***TRU-STEEL is the lowest priced premium steel shot on the market!*** New equipment and improved manufacturing methods make TRU-STEEL the best steel shot available today—and at much lower price than any comparable abrasive. As new technological advances have been made . . . as new production techniques have been evolved . . . they have been incorporated in the manufacture of TRU-STEEL to make better *and* cheaper steel shot for you. Compare costs yourself and see!

For more information or for the name of your nearest TRU-STEEL distributor, write us today. And don't forget! We'll be at the 1954 Foundry Show . . . look for the striped bags and the TRU-STEEL booth.

STEEL SHOT PRODUCERS, INC.

BUTLER, PA.

Subsidiary of

Pittsburgh Crushed Steel Company, Pittsburgh, Pennsylvania

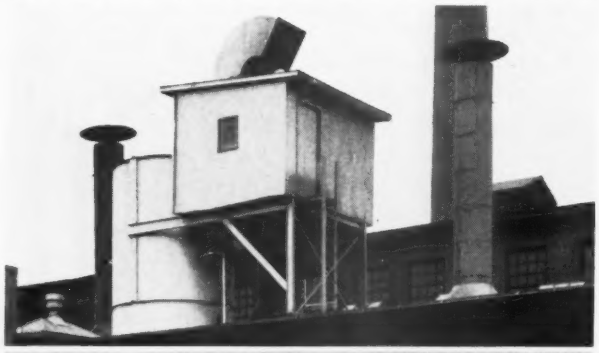
Oldest and largest manufacturers of metal abrasives in America

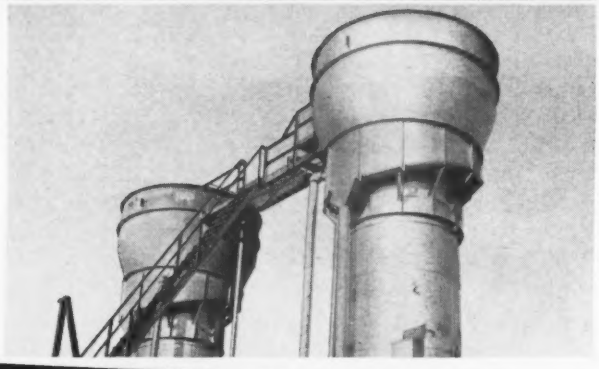
1954 FOUNDRY SHOW
Cleveland, Ohio
See TRU-STEEL at
Spaces 610-612
North Hall

Small foundries—too,

BUY SCHNEIBLE EQUIPMENT FOR BETTER DUST CONTROL!

AT THE FOUNDRY SHOW VISIT OUR BOOTHS 1425-1427





The smaller foundries — too, are users of Schneible Dust Control Equipment. Like the large production foundries, they have found Schneible has the experience and the equipment best suited for all foundry dust control.

The Schneible line of Multi-Wash Collectors, Uni-flo Shakeout Hoods, Cupola Collectors and auxiliary units has been designed with all types and sizes of foundries in mind.

If you are considering any dust control equipment *be sure* to include a quotation from Schneible. You'll be offered equipment that suits your requirements at a price that is within your budget.

Contact the local Schneible representative or write or phone direct for detailed information.

SCHNEIBLE

Cable Address: CBSCO
European Licensee: Elex S. A., Zurich, Switzerland

CLAUDE B. SCHNEIBLE COMPANY
P. O. Box 81, North End Station • Detroit 2, Michigan

PRODUCTS

Multi-Wash Collectors • Uni-Flo Standard Hoods • Uni-Flo Compensating Hoods • Uni-Flo Fractionating Hoods • Water Curtain Cupola Collectors • Ductwork • Velocitrap • Dust Separators • Entrainment Separators • Settling and Dewatering Tanks • "Wear Proof" Centrifugal Slurry Pumps

LATE NEWS

APRIL 19 1954

JOINS GIFS: Charles F. Walton, professor of metallurgy, Case Institute of Technology, Cleveland, has been appointed technical director of the Gray Iron Founders' Society. Mr. Walton, who will assume full duties on June 7, succeeds the late Charles O. Burgess.

CONSTRUCTION UP: Expenditures for new construction rose seasonally in March to $2.5 billion. This brought the first quarter total to a record $7.3 billion, slightly ahead of the 1953 total for the period. Most of the March gain reflected expansion in private housing and public utility construction, plus an increase in highway work.

SCRAP EXPORTS: Beginning Apr. 1, exporters of iron and steel scrap are not required to submit evidence of availability or inspection certificates in connection with export license applications. In addition, export licenses hereafter will be valid for six months instead of for only 60 days as formerly.

Under the open-end licensing policy in effect for the first quarter this year, the Bureau of Foreign Commerce up to Mar. 29 licensed 183,678 tons of scrap for export from the continental United States and 12,715 tons from offshore possessions. This compares with about 280,000 tons licensed in the fourth quarter last year.

METAL CONTROLS EASED: A revised Defense Materials System went into effect Apr. 1 under the direction of the Business and Defense Services Administration. Hereafter only prime contractors and principal suppliers will have to report on procurement, receipts, shipments and inventory of controlled materials. This will relieve 90 per cent or more of consumers of reporting. At the same time the system provides for an orderly and rapid expansion for military and Atomic Energy Commission production and construction in the event of a new emergency.

CENSUS: Committee appointed by the Department of Commerce to study census programs of the Bureau of the Census has made the following recommendations: That the complete census of manufactures, last taken in 1947 and scheduled for 1954 on 1953 data, be taken in 1955 on 1954 data, and continued thereafter on the original five-year basis; that the annual survey of manufactures be continued and strengthened with improved sampling techniques; that no additional funds be requested for a transportation census pending further review; that a complete census of agriculture be taken for the 1954 crop year.

FOR SMALL BUSINESS: A new leaflet explaining ways in which a small business concern can build up its sales volume is obtainable from field offices of the Small Business Administration. It includes a check-list of questions to assist in pointing out the strong and weak factors in a firm's sales management and in indicating what steps for improvement should be taken.

PRICE CUTS: Prices of 50, 65 and 75 per cent grades of ferrosilicon have been reduced by Electro Metallurgical Co., a division of Union Carbide & Carbon Corp. The cut in 50 per cent ferrosilicon is 1.6 cents. Corresponding reductions for related alloys such as silicon briquets, silicomanganese and ferrochrome-silicon also have been made.

Dow Chemical Co. has reduced the price of its commercial magnesium die casting alloy ingot (AZ91B) by 1 cent a pound to 27 cents, f.o.b. Madison, Ill.

HONORED: Department of Commerce has awarded its silver medal for meritorious service to Samuel J. Rosenberg of the National Bureau of Standards for "important contributions to the science and technology of physical metallurgy for over 30 years, including meritorious authorship."

WEST COAST BUSIER: Optimism over business prospects is more evident among West coast foundrymen as operations exceed earlier estimates. Backlogs of both ferrous and non-

ferrous shops are lengthening slowly. Defense work continues to be an important factor in activity of light metal foundries.

MANAGEMENT CHANGE: H. Brinton Co., Philadelphia manufacturer of knitting machinery, has placed its subsidiary, Brinton Foundry Inc. under separate management. John F. Deery, general manager of the foundry the past 15 years, has been elected president.

NEW FOUNDRY: Etheridge Foundry & Machine Co., Portland, Me., has started construction of a new 40 x 130-ft gray iron foundry at 1027-1039 Ocean Ave. It is expected to be in operation by June. Replacing a foundry at another address which burned in February, the new plant will include a pattern shop, machine shop, cleaning room, coreroom and molding floors.

FOUNDRY HEAD DIES: Ralph G. Sweeney, 55, president and general manager of the Allyne-Ryan Foundry Co., Cleveland, died there Apr. 12.

MISCELLANY: Waunakee Alloy Casting Corp., Waunakee, Wis., formally opened its new foundry Apr. 5. The company is headed by Jack Trantin Jr., president, Youngstown Alloy Casting Corp. . . . Arwood Precision Casting Corp., Groton, Conn., has been granted a certificate of necessity for accelerated tax amortization covering an $83,700 plant expenditure . . . March freight car deliveries totaled 4823, against 3974 in February and 6679 a year ago; orders totaled 348 cars, and backlogs slumped to 20,966 at the month's end, according to the American Railway Car Institute and the Association of American Railroads.

American Radiator & Standard Sanitary Corp. has closed its Litchfield, Ill., magnesium foundry for an indefinite period . . . Elmer E. Ditty, recently secretary, has been elected president of Federal Foundry Supply Co., Cleveland, succeeding his father, the late Ralph Ditty. Louis H. Heyl has been elected executive vice president and general manager, and George E. Tate has been re-elected treasurer.

PRICES OF FOUNDRY METALS AND COKE (As of Apr. 19, 1954)

FOUNDRY COKE

(Per net ton, f.o.b. ovens)

BEEHIVE	
Connellsville	$16.50–17.00
OVEN	
Birmingham	$22.65
Chicago	24.50
Detroit	25.50
Erie, Pa.	25.00
Everett, Mass.	23.50
Indianapolis	24.25
Kearney, N. J.	24.00
Milwaukee	25.25
Painesville, O.	25.50
Philadelphia	23.95
Portsmouth, O.	24.00
St. Louis	26.00
St. Paul	23.75
Swedeland, Pa.	23.00
Terre Haute, Ind.	24.05

PIG IRON

(Per gross ton f.o.b. furnace)

	No. 2 Foundry	Malleable
Bethlehem, Pa.	$58.50	$59.00
Birmingham	52.88	....
Buffalo	56.50	57.00
Chicago	56.50	56.50
Cleveland	56.50	56.50
Everett, Mass.	61.25	61.75
Fontana, Calif.	62.50	....
Geneva, Utah	56.50	....
Granite City, Ill.	58.40	58.90
Lone Star, Tex.	52.50	52.50
Neville Island (Pittsburgh)	56.50	56.50
Steelton, Pa.	58.50	59.00
Swedeland, Pa.	58.50	59.00
Toledo, O.	56.50	56.50
Troy, N. Y.	58.50	59.00
Youngstown, O.	....	56.50

NONFERROUS INGOT

(Cents per pound, carlots)

BRASS AND BRONZE: Red brass, No. 115, 26.00; tin bronze, No. 225, 38.50; No. 245, 32.25; high-leaded tin bronze, No. 305, 31.00; No. 1 yellow, No. 405, 22.25; manganese bronze, No. 421, 26.75.

ALUMINUM: 99 per cent plus, primary ingots 21.50c. Secondary No. 12 alloy 20.00-21.00. Deoxidizing grades: No. 1 21.00-22.00; No. 4 18.00-19.00.

MAGNESIUM: 99.8 per cent standard ingots 27.00c, f.o.b. Freeport, Tex.

COPPER: Electrolytic 30.00, delivered Connecticut valley.

ZINC: High grade 11.60, delivered. Die casting alloy 14.25c, delivered.

IRON AND STEEL SCRAP

(Consumer prices per gross ton delivered, except as otherwise noted)

	No. 1 Heavy Melting Steel	No. 1 Cupola Cast	Heavy Breakable Cast	Clean Auto Cast	Machinery Cast	Malleable	Short Steel Rails
Birmingham	$19.00–20.00	**$39.00–40.00	**$28.00–29.00	.....	.....	.....	$39.00–40.00
Boston*	**13.25–15.00	**29.00–30.00	.....	.....	**36.00–37.00	.....	.....
Buffalo	23.00–24.00	**34.00–35.00	.....	.....	**37.00–38.00	.....	40.00–41.00
Chicago	27.00–28.00	38.00–39.00	.....	40.00–42.00	41.00–42.00	39.00–40.00	42.00–44.00
Cincinnati*	**23.00–24.00	**36.00	**31.00	.....	**42.00	**32.00–33.00	**42.00–43.00
Cleveland	22.00–23.00	38.50–39.50	23.50–24.50	39.50–40.50	39.50–40.50	38.00–39.00	41.00–45.00
Detroit*	**17.00	**36.00	**25.00	**40.00	.....	**28.00	.....
Los Angeles	20.00	**40.00	.....	.....	.....	.....	.....
New York*	14.00	29.00–30.00	.....	.....	.....	.....	.....
Philadelphia	22.00	35.00	36.50–37.50	.....	41.00	.....	.....
Pittsburgh	26.00–27.00	36.00–37.00	30.00–31.00	.....	42.00–43.00	.....	44.00–46.00
St. Louis*	24.25–25.25	37.00	23.00	39.00	.....	.....	38.00
San Francisco	20.00	39.00	36.00	39.00	43.00	.....	.....
Seattle	23.00	**30.00–35.00	**25.00	.....	.....	.....	.....

*Brokers' buying prices. **F.o.b. shipping point.

What do you expect?

Hundreds of satisfied users of **HYGEIA** Seacoal have found their own advantages in adopting the "original" and *new* dust-free seacoal. Here are some of their reports to us:

1. Permanently Dust-Free

"Less seacoal dust even at the shake-out. Material dust-free throughout its use—and re-use."

2. Less Material Loss

"Less fines exhausted at the muller and from heap sand returning to system. Because we've eliminated excessive loss of fines, I can now use the next finer grind I've been wanting to use."

3. Cleaner Handling

"The man at the muller shows more interest in his job. He could ruin a lot of castings if he became slipshod with his mixes. He *likes* **HYGEIA**!"

4. More Economical

"With less loss I find I can use less to get an equal or better finish."

These are only a few of the advantages that the user himself has reported to us. Find out for yourself the advantages of using **HYGEIA** Seacoal and **HYGEIA** Pitch.

VISIT OUR EXHIBIT IN CLEVELAND—BOOTH No. 317

Buy the Best—Buy HYGEIA!

PENN-RILLTON COMPANY

324 West 23rd Street, New York 11, New York

STRATEGIC LOCATIONS

of Semet-Solvay's Coke Plants and Coal Mines

mean . . .

1

SECURITY OF SUPPLY

Semet-Solvay Division is the only merchant coke producer with four coke plants. Our 701 coke ovens . . . our recent expansion . . . our new, tremendous rated capacity of 3,750,000 tons of coke a year means that you can depend on Semet-Solvay for *all* the foundry coke you need.

2

BETTER SERVICE

You can't beat the dependable service readily available from a Company which not only has a plant near you, but also has plants on the edge of the best by-product coal field in the world. Look at the map on the opposite page . . . See why Semet-Solvay can serve 82% of the gray iron foundries in the U. S. and Canada conveniently and economically from one or more of its plants. Strategic locations does it!

3

BETTER COKE

Semet-Solvay Foundry Coke is famous for its closely controlled quality . . . for, from the selection and cleaning of special coking coals from our own mines to the screening and loading of high-quality, uniformly sized foundry coke, every operation is under strict Semet-Solvay control.

Plus

FREE METALLURGICAL SERVICE

Trouble or variable results in a foundry can very often be quickly diagnosed by an outside consultant. That's why Semet-Solvay has a staff of experienced foundry metallurgists. These men are practical foundrymen, and they are at your service — without obligation — for just a call to our nearest sales office.

Sales Offices

BUFFALO
602 Genesee Building
Buffalo 2, New York

CINCINNATI
723 Dixie Terminal Building
Cincinnati 2, Ohio

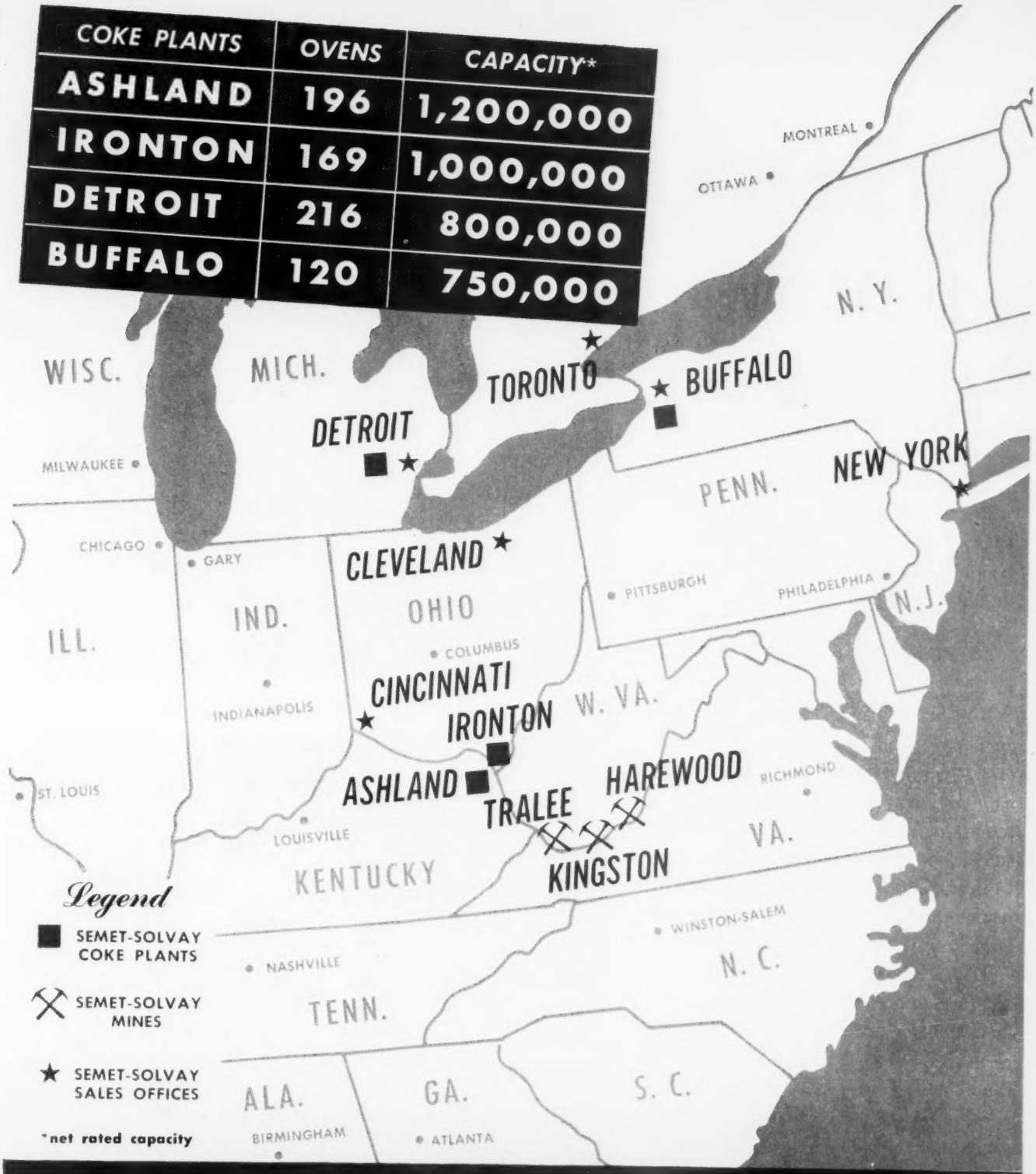
CLEVELAND
2405 Terminal Tower Building
Cleveland 13, Ohio

DETROIT
2532 Buhl Building
Detroit 26, Michigan

TORONTO
1317 Canadian Bank of Commerce Building
Toronto 1, Ontario, Canada

A Better America Through Chemical Progress

CHEMICAL PROGRESS WEEK-MAY 17-22



SEMET-SOLVAY DIVISION

Allied Chemical

IRON AND STEEL SHOPS SAVE WITH TRULINE®

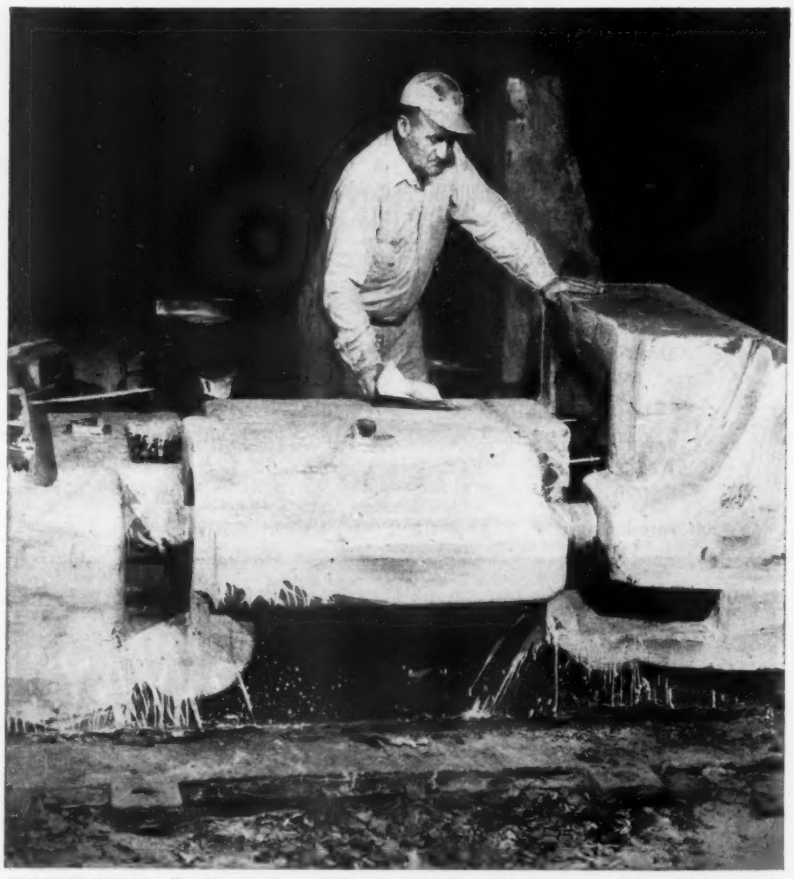
Today's accent on economy offers foundrymen convincing reasons why they should use Truline Binder in core sands. Savings in both man-hours and material costs are obtained in producing quality castings.

Iron shops using Truline for gravel and black sand cores report as high as 50 per cent reduction in shake-out and baking time. The high baked strength tends to eliminate core breakage. In some cases, iron foundries have successfully used Truline in a mixture of half heap sand with new, for medium and large core work.

Truline gives faster and more uniform baking—smoother, cleaner casting surfaces. Steel shops report its high efficiency in core facing sands, backing sands, and pouring cup mixes. Truline is equally effective for skin dry and dry sand molds. It has high resistance to moisture pickup.

Let us give you the up-to-date story on how Truline can help you save time and money.

BAKES OVERNIGHT—Iron shops solve baking bottlenecks by using Truline. This core was baked thoroughly in one night at 400°F.—halving the time required with other binders.



COLLAPSES QUICKLY—Truline helps prevent cracked castings, even where thickness of metal sections varies from one and one-half inches to eight, because cores collapse easier.

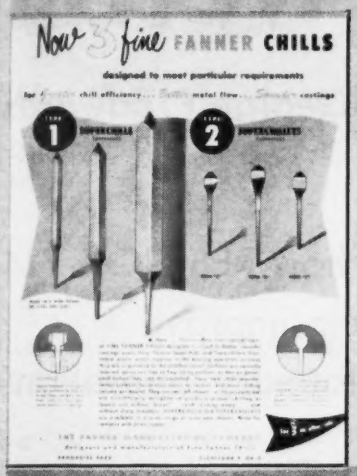
Naval Stores Department
HERCULES POWDER COMPANY
INCORPORATED
920 King St., Wilmington 99, Delaware

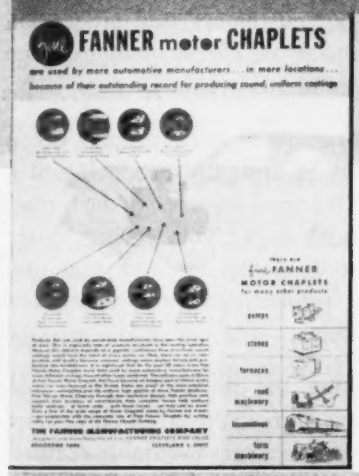
NF54-2

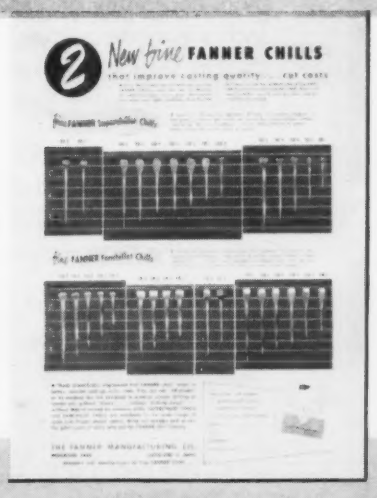
fine FANNER products

For years you have been reading about FANNER developments for the improvement of castings, since fine FANNER chaplets and chills have been regarded as the standard in the foundry industry for almost 60 years. Today FANNER is the world's largest manufacturer of chaplets and chills and the only organization making a complete line to meet all needs. Cleveland is our home and while you are attending the AFS Convention we invite you to visit with us and see how and why fine FANNER chaplets and chills do a better job for you at the lowest cost!

ONE BY ONE
YOU SEE
THEIR ADVANTAGES
IN PRINT
every month







THE FANNER MANUFACTURING CO.
BROOKSIDE PARK **CLEVELAND 9, OHIO**
Designers and Manufacturers of Fine Fanner Chaplets and Chills

Now
see them IN PERSON
Booth No. 1105
AFS Convention • Public Auditorium
CLEVELAND MAY 8-14
Fanner **Headquarters: Hotel Hollenden**

"We have cut in half with

—George P. Edwards

Woodruff & Edwards foundryman removes pattern and uncured shell from the investment box.

Resinox 714, when mixed with fine-grained sand, forms a thin-walled, rigid mold.

Learn how RESINOX 714 can help improve *your* foundry operation!

"We find that the shell molding process helps cut our customers' end-production cost – as much as 75 per cent in some cases," states Mr. Edwards.

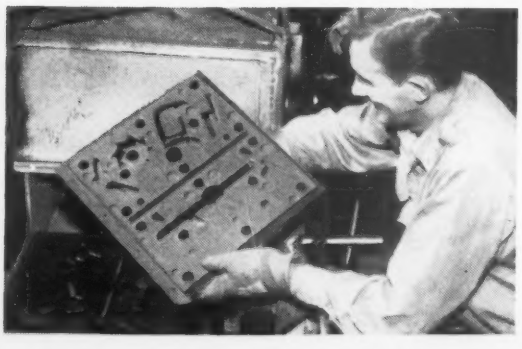
A typical example he cites is a part which his company is presently producing at a cost of $3.70 a unit compared to the former cost of $6.90 each. This savings came from reduced machining and less material, with resultant lower shipping and handling costs.

Operator ejects shell from pattern on a shell molding machine built by Woodruff & Edwards.

A leader in shell molding among the midwest's gray iron foundries, Woodruff & Edwards is principally a jobbing shop, and considers its shell molding operation a very profitable venture. They are currently holding castings to a plus-or-minus .003″ per inch, depending on casting design, and plus-or-minus .010″ per inch across the parting line. And many foundries are finding that thinner sections and more intricate shapes with much finer detail can be cast, using Resinox 714.

Shell molding engineer, Wayne Wright, of Woodruff & Edwards, says, "We have used Resinox 714 in larger quantities than any other resins and find it meets our needs . . . helps produce castings to the most exacting specifications."

Mr. Wright reports *an increase in metal yield,* plus a *large saving in sand handling.* For instance, a 14 x 16 inch shell mold, using



Inspecting the shell after it is removed from the pattern. Note the detail.

production costs shell molding!"

Woodruff & Edwards, Inc., Elgin, Illinois

Resinox 714, weighs about *seven pounds,* whereas a green sand mold of the same size would require about 60-80 pounds of sand.

Far less cleaning of the finished product is needed with shell molded parts, states Mr. Wright, with grinding required only at the gates and core print. There is also more allowance for flexibility of product design –and surface areas are comparable to a permanent mold finish. Much finer sands can be used without resultant gas inclusion. "Clean, sharp edges, such as gear teeth, can be cast – and the parts used as cast," says Mr. Wright.

"Chill or scale is also practically eliminated on the outer edges of the casting sections," states Mr. Wright. "This means less allowance for finish stock, and longer tool life. Internal stresses are minimized because shell molds promote directional solidification."

Plant engineers find that shell molding, with Resinox 714, saves about 80 per cent of floor space, increasing square-foot productivity at a corresponding rate. Woodruff & Edwards shell mold aluminum and brass pieces as well as gray iron.

Learn how Resinox 714 and Monsanto's other foundry resins can meet your exact needs and improve your productivity. Mail the coupon today for complete details. And for the full story on Monsanto's complete line of foundry resins, be sure to visit the Monsanto exhibit (Booth 1326-30) at the Cleveland foundry show.

Here the shells are assembled. The good permeability, insulating properties, strength and smoothness of a sand-Resinox 714 shell permit precise dimensional accuracy.

Molten metal is poured into the mold. The permeability of a sand-Resinox 714 shell mold permits gases to escape, eliminates many metallurgical defects such as blowholes, porosity, and cold shuts.

MONSANTO

SERVING INDUSTRY . . WHICH SERVES MANKIND

MONSANTO CHEMICAL COMPANY, Plastics Division, Room 5704,
Springfield 2, Mass.
Please send me complete information on:
..... Resinox 714 phenolic resin; ..... other Monsanto shell molding resins; ..... Monsanto core binding resins;
..... Lytron sand conditioner.

Name & Title _____

Company _____

Address _____

City, Zone, State _____

Naturally we are well satisfied with our LANLY OVEN

says Mr. R. R. MILLER, *President*
Precision Metalsmiths, Inc.
CLEVELAND 17, OHIO

SIMPLIFYING MANUFACTURERS PROBLEMS is their SPECIALTY...

Supplying precision castings of single components or complete assemblies . . . ranging in weight from a fraction of an ounce to over several pounds in unlimited quantities of ferrous and non-ferrous alloys.

Just a few of these "cast masterpieces" are shown here. As Mr. Miller states, his LANLY OVEN is responsible in no small way for the consistent, excellent results obtained on a "round the clock" production schedule.

Precision Metalsmiths, Inc.
PRECISION INVESTMENT CASTINGS • FERROUS & NON-FERROUS
CONSULTATION • RESEARCH • DEVELOPMENT
1081 East 200th Street Cleveland 17, Ohio
Telephone: IVanhoe 1-8900

February 23, 1954.

The Lanly Co.
750 Prospect Avenue,
Cleveland 15, Ohio.

Gentlemen:

We thought you might be interested in receiving our comments on the Lanly Mold Curing and Wax Reclaiming oven purchased from you in February, 1952.

This oven is certainly well engineered as it has been in constant operation from the date of installation without any down-time due to failures of any nature.

We maintain a 210° temperature for curing invested molds. These molds have considerable water and wax in them. Between 6-8 hours is required for curing.

Previously in another type of oven it took between 24-30 hours for the same operation!

In short, we have had uninterupted performance on a 24 hour production basis from our Lanly and naturally are well satisfied.

Very truly yours,

PRECISION METALSMITHS, INC.,

R. R. MILLER,
President.

RRM:rg.

YOU TOO, CAN DO A BETTER JOB WITH LANLY OVENS

Write Today for Details and Let Us Show You How!

LANLY
FOUNDRY OVENS
THE LANLY COMPANY • 780 PROSPECT AVE
CLEVELAND, OHIO

HOW TO PUT THE SQUEEZE ON BLAST CLEANING COSTS

U. S. Patent #2184926
(other patents pending)

. . . ***USE MALLEABRASIVE, SHOT OR GRIT.*** Scientifically heat-treated for durability, Malleabrasive lasts longer. Laboratory controlled for strength and consistency, Malleabrasive cleans better faster. And because it does a better job in less time with fewer refills, Malleabrasive cleans *cheaper!* See for yourself. Next time you order blast cleaning abrasive, specify Malleabrasive from Pangborn Corp., 1400 Pangborn Blvd., Hagerstown, Maryland.

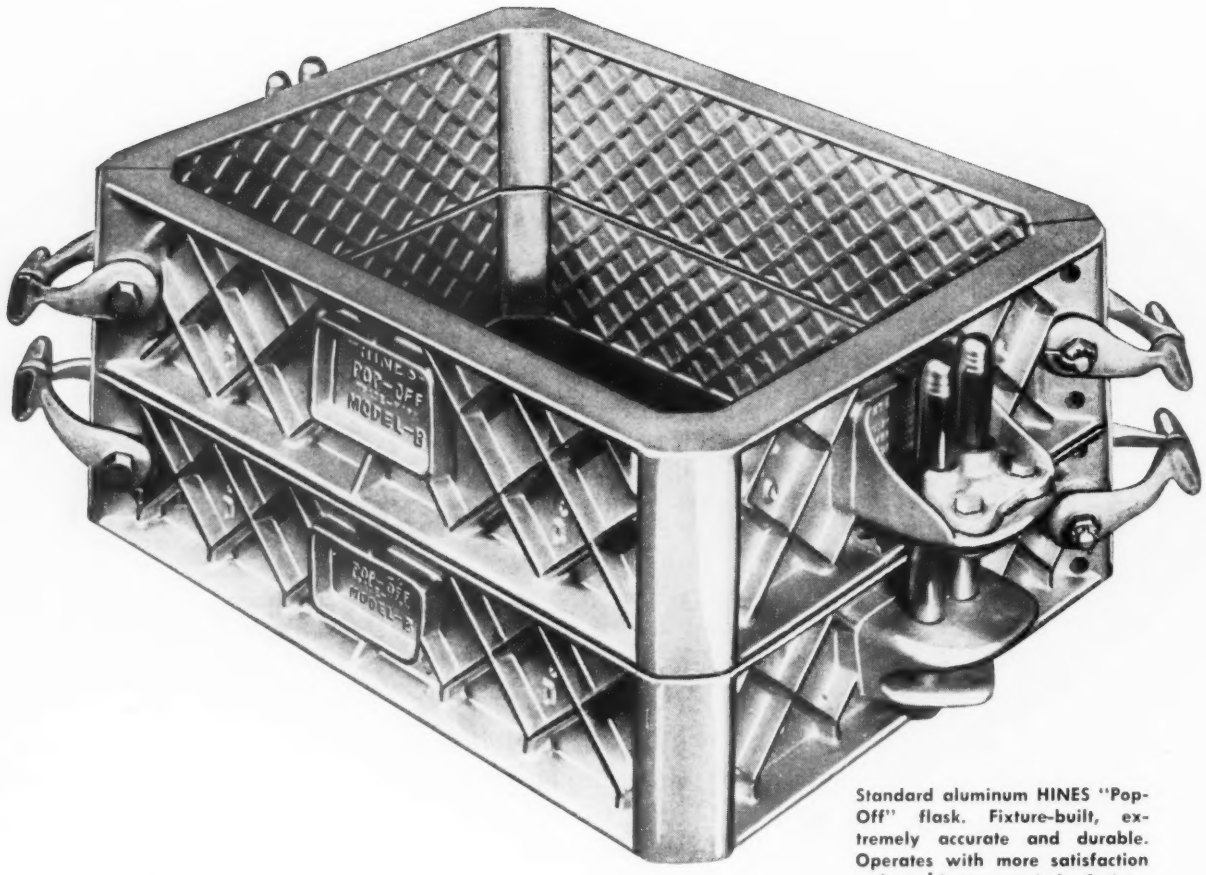
Pangborn DISTRIBUTORS FOR

MALLEABRASIVE®

PANGBORN'S 50th ANNIVERSARY—1904-1954

PLANNING TO

MODERNIZE



Standard aluminum HINES "Pop-Off" flask. Fixture-built, extremely accurate and durable. Operates with more satisfaction —for a longer period of time. No mauling or pounding necessary for removal — simply move the levers and off it pops!

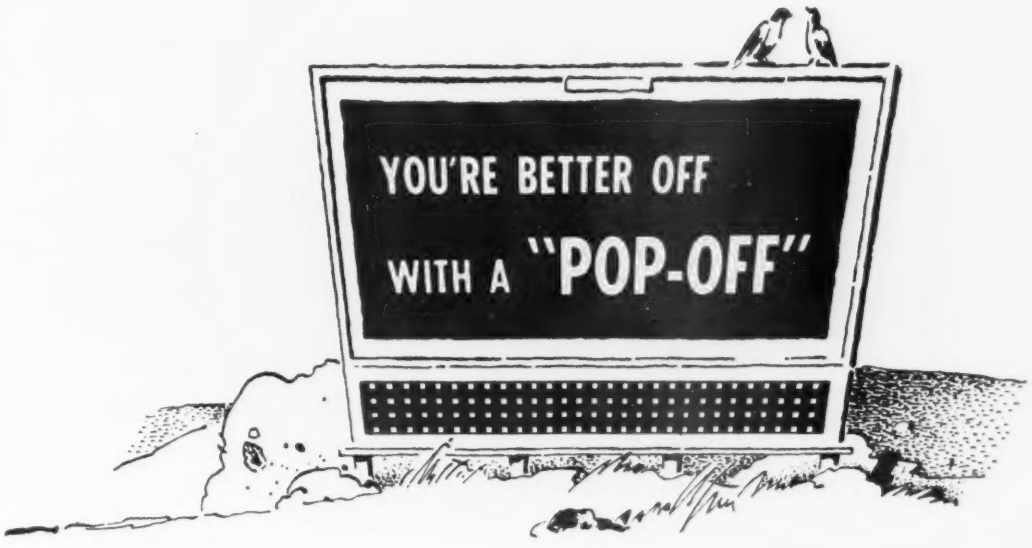
HINES POP-OFF FLASK

MEMBER FEMA

THE

your molding department?

. . . . then, by all means, stop in at Booth 1214, AFS Foundry Show, to find out why . . . .



HINES FLASK CO.

3431 WEST 140TH STREET • CLEVELAND 11, OHIO • PHONE ORCHARD 1-2806

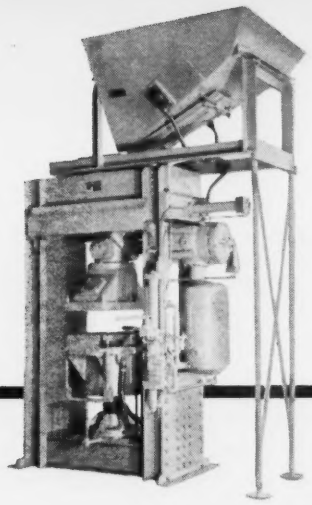
4 good reasons why

FOUNDRIES LOOK TO DEMMLER FOR CORE BLOWERS!

It was in 1909—44 years ago—that Demmler first introduced the core blower. It was only natural that when foundries encountered special core blowing problems they turned to Demmler engineers—the pioneers in the field. Year after year, Demmler has consistently led with "firsts" in core blower design. The four machines at right are four good examples of this leadership. When you have a problem and need a specially designed core blower that is tailor-made for your particular operations, call in a Demmler engineer. There's no obligation.

Come in and see us. Booth 1206 at the show May 8-14.

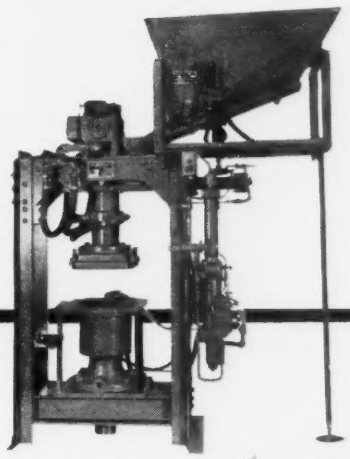
Model 103 CORE BLOWER



DEMMLER *Model* 100 Series CORE BLOWERS-Available in four sizes

A number one reason for Demmler leadership. The Demmler 100 Series was designed for fast operation on defense project where it was necessary to blow 2,000 cores per hour! Now it is available for faster core blowing in your foundry. Stationery magazine type core blowers capable of blowing ANY core or molding sand.

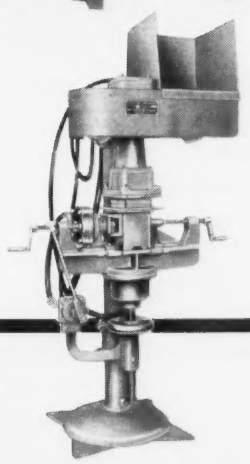
Model 1E-OS CORE BLOWER



DEMMLER *Model* 1E-OS CORE BLOWER

This core blower is another production pace setter. It can be used with two drag halves so the operator can remove one core while the second core is being blown. Double production because there is no waiting! One push of the starting lever and the machine automatically completes one cycle and the magazine returns to filling position. Write for information about this production-worthy Demmler 1E-OS.

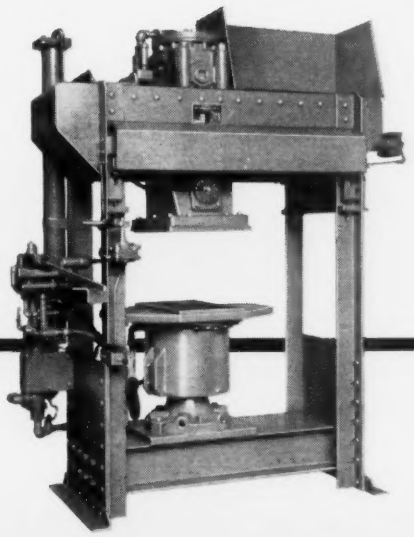
Model 55 CORE BLOWER



DEMMLER *Model* 55 CORE BLOWER

This little giant is unequalled among competitive core blowers for fast, economical production on short run jobs. The Demmler 55 has one hand valve that operates both vertical and horizontal core box clamps and blows the core—in only 3 seconds! Used for core boxes with depths up to 10″, handles cores up to 4 lbs. A wide range of sand magazine bottom openings available to meet all your core box dimensional requirements.

Model 2E CORE BLOWER

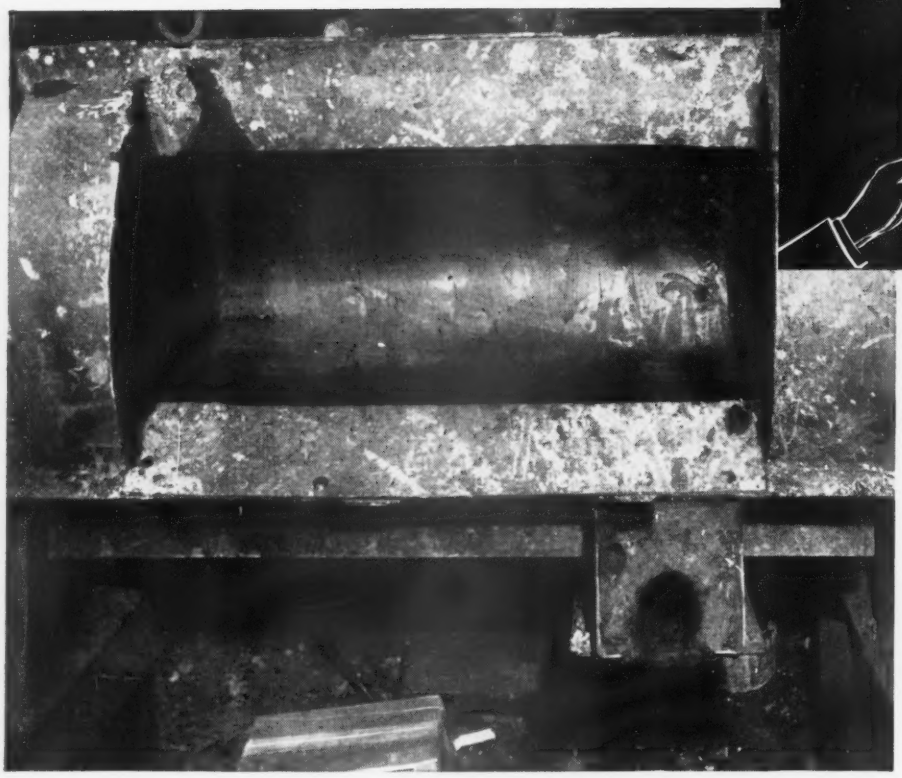


DEMMLER *Model* 2E CORE BLOWER

Built for rugged service without maintenance troubles. The Demmler 2E handles cores up to 20 pounds. Available with manual, semi-automatic or fully automatic controls. The draw cylinder is 14″ in diameter and the machine has a 10″ stroke. The drawing post is completely enclosed and protected from sand and abrasion to guarantee accuracy and trouble-free operation. Ultra high speed blow valve action increases initial blow pressure 25%.

All models of Demmler Core Blowers can be furnished with vibratory sand feeders as shown above on the 100 series and the 1E-OS.

WRITE FOR LITERATURE • WM. DEMMLER & BROS. • Kewanee, Illinois



"BLACK MAGIC"

WALSH GRAFLOK PLASTIC WORKS WONDERS IN YOUR LADLE LININGS

"LOK"ing out the destructive affects of metal oxides and slags for greatly increased service life is the feat performed by Walsh Graflok Plastic Ladle Lining.

ADVANTAGES:

Easier Flow of Metal • Reduces Wear on Lining • Graphite Lubricating Effect Cuts Slag Adherence—Makes Removal Easier • Slashes Refractory Cost Per Ton of Metal Melted

USES:

- **Receiving and Mixing Ladles**
- **Bull Ladles, Hand Ladles—All Types of Foundry Ladles**
- **Spouts of Cupolas and Malleable Iron Furnaces**
- **Tap Holes, Slag Holes and Cupola Wells**
- **Nozzle Wells of Bottom Pour Ladles**
- **Hot Metal Troughs and Runners**
- **Lining of Cupola Front Slagging Spouts**

Walsh also makes—Graflok Ladle Coating. In dry form, in 100 lb. waterproofed bags, ready for immediate use by the addition of water.

Packed in 100 lb. waterproofed cartons—ready for use—sliced for ease in handling and in dry form for operators preferring plastic consistency for their particular needs. Packed in 100 lb. water proofed bags, for mixing with water on job.

WRITE FOR FREE GRAFLOK BULLETIN

WALSH REFRACTORIES CORPORATION — America's Best Clays

WALSH REFRACTORIES CORPORATION

101 FERRY STREET • ST. LOUIS 7, MISSOURI

FOR OVER 50 YEARS MANUFACTURERS OF HIGH GRADE REFRACTORIES

We can CUT your Bulk Material Handling Cost

Let us prove . . . BY A DEMONSTRATION . . . the many advantages of loading with the combination of Clutch-Type Transmission and Hydraulic Torque Converter . . . brought to you by the

TRACTOMOTIVE TL-10 TRACTO-LOADER

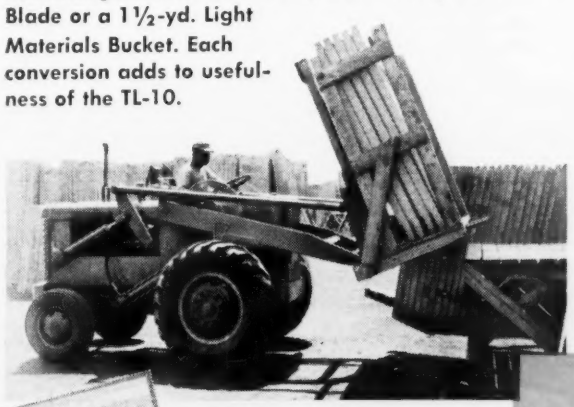
SEE how the smooth-operating HYDRAULIC TORQUE CONVERTER DRIVE speeds loading — no butting or ramming, no engine stalling. No clutching either — operator crowds steadily into pile using only the foot throttle and bucket control levers. Wheel spin is practically eliminated, tire wear greatly reduced. Bucket action is snappy at all times because speed of engine and hydraulic pump remain constant.

SEE how the specially designed CLUTCH-TYPE TRANSMISSION eliminates most shifting. You simply push a lever to go forward, pull it back for reverse. Reverse is almost twice as fast as forward.

SEE how easy it is to maneuver the TL-10. Bucket over drive wheels utilizes weight of load for greater traction... eases weight on rear steering wheels. Turning radius is only 11 ft. at tip of bucket . . . works in areas that would normally accommodate only lower capacity machines. You can turn from a 9-ft. aisle into a 10-ft. bin!

Only by watching the TL-10 work can you fully realize the great savings you can make on bulk material handling. Let us arrange a demonstration NOW! Wire, write or call.

Added Versatility Standard bucket is quickly interchangeable with Lift Fork, Crane Hook, Dozer Blade or a 1½-yd. Light Materials Bucket. Each conversion adds to usefulness of the TL-10.



Write to us — for literature on the TL-10 and see your nearest Allis-Chalmers Industrial Tractor Dealer.

Never-Anywhere— A WHEEL LOADER LIKE THIS!

¾ cu. yd. bucket — weight 11,400 lb. — 63 brake hp. Has dynamic, new Allis-Chalmers POWER-CRATER engine . . . gives you high-octane performance on regular gasoline.

POWER-CRATER is an Allis-Chalmers trademark.

TRACTOMOTIVE

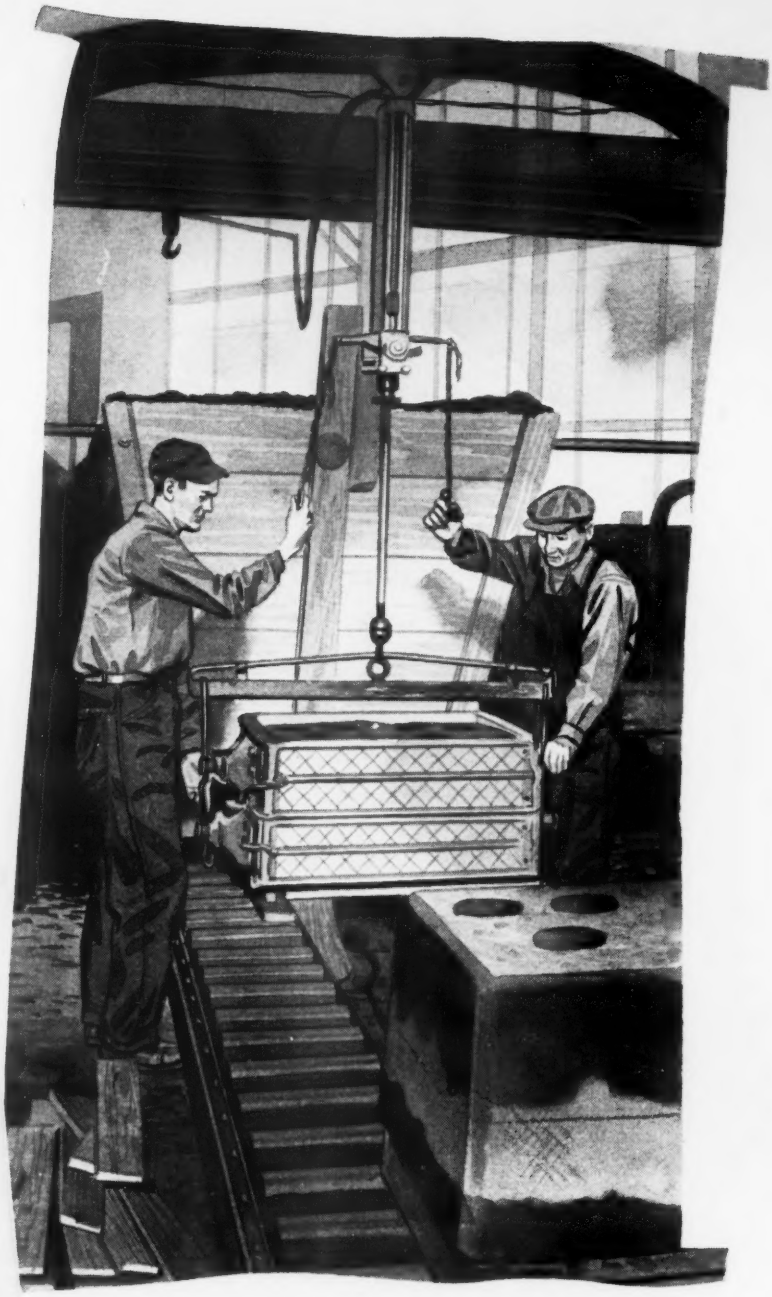
TRACTOMOTIVE CORPORATION, DEERFIELD, ILLINOIS

Tracto-Loaders • Tracto-Shovels, Side Booms and Hydraulic Rippers for Allis-Chalmers Crawler Tractors • Loader and Shoulder Maintainer for Allis-Chalmers "D" Motor Grader

. . be sure with a

NATIONAL BENTONITE

bond !



A dependable National Bentonite bonded mold means better production, better castings, less time in the cleaning room. Many experienced foundrymen have relied on National Bentonite for years because of consistently uniform high quality . . . good green strength . . . high hot strength . . . high sintering point . . . good mold durability . . . and because it requires the least water to temper correctly. You, too, can be sure of better bonds with NATIONAL BENTONITE. Quick service from better foundry suppliers everywhere.

Baroid

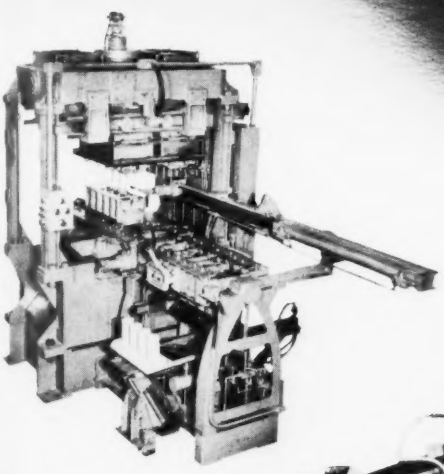
Baroid Sales Division ☆ National Lead Company

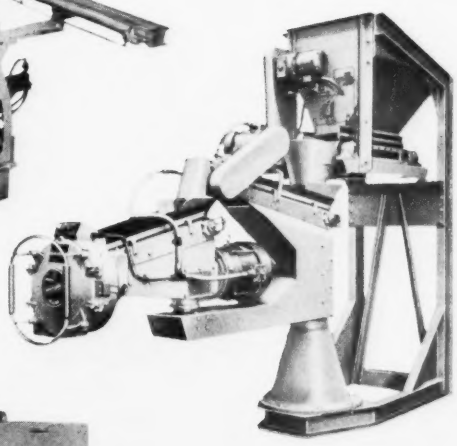
Bentonite Sales Office: Railway Exchange Building, Chicago 4, Illinois

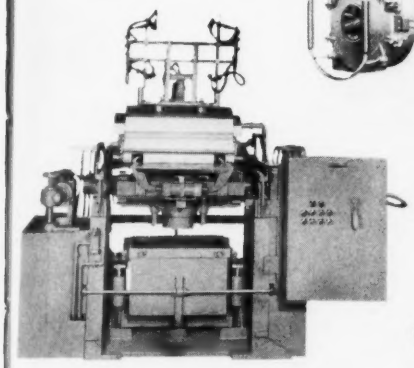
4721

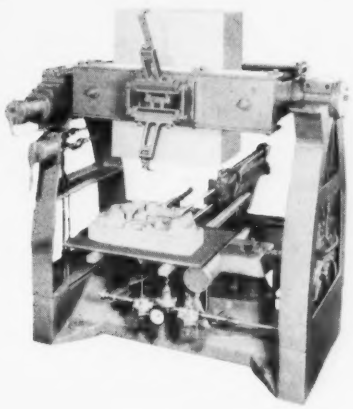
SUTTER

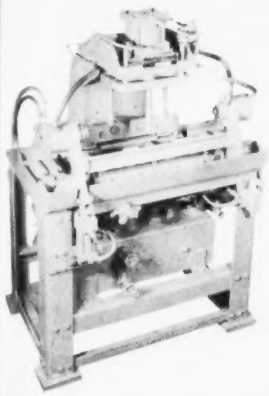
advanced design foundry equipment . . .

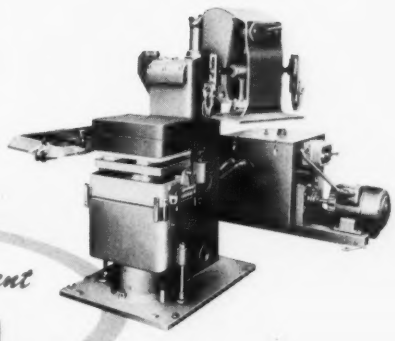












Is your foundry production in step with today's pace—are you meeting today's rigid dimensional requirements—do time studies show you are attaining maximum efficiency? If the answer is "no" to any of these questions, it will pay you to check the features and advantages of Sutter foundry equipment on the next three pages.

Sutter equipment is now in foundries all over the world . . . increasing production, improving quality and providing outstanding economy. It can do the same for you.

See Sutter Equipment

IN OPERATION

FOUNDRY SHOW—*Booths 1310-1316*

SUTTER

PRODUCTS COMPANY

2005 WESTWOOD AVE. • DEARBORN, MICH.

INCREASE CORE PRODUCTION

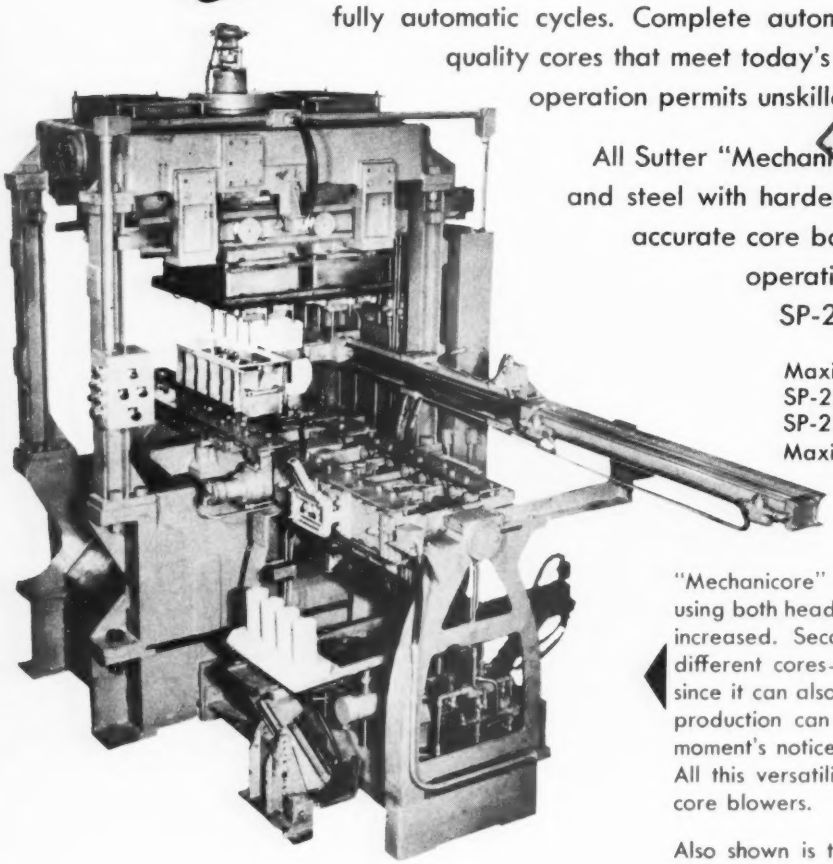
SUTTER

AUTOMATIC CORE BLOWERS

PAT. PENDING

Sutter "Mechanicore" Core Blowers provide up to 400 blows per hour with fully automatic cycles. Complete automatic operation results in consistent, high quality cores that meet today's rigid quality requirements. Too, automatic operation permits unskilled operators to maintain peak production.

All Sutter "Mechanicores" are sturdily constructed of cast iron and steel with hardened and ground guides and bushings for accurate core box and blow plate alignment, dependable operation and long life. Available in two models, SP-220 (single head) and SP-221 (dual head).



Maximum core box size
SP-220 . . . 36″ long x 20″ wide x 12″ deep
SP-221 . . . 36″ long x 15¾″ wide x 12″ deep
Maximum core weight 125 lbs.

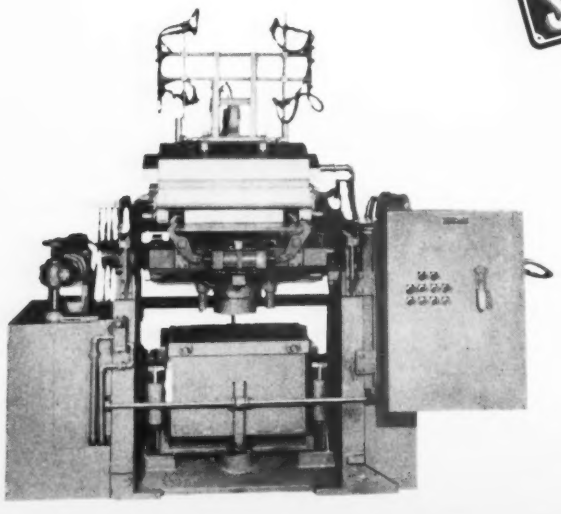
The Sutter SP-221 core blower provides flexibility that means easy scheduling of daily production. With the Sutter Dual-Head "Mechanicore" three different schedules can be achieved. First, using both heads for the same core, production can be substantially increased. Second, full production can be maintained on two different cores—even with different sand—simultaneously. Third, since it can also be used as a single head blower on either head, production can be switched from one core to the other with a moment's notice . . . no daily shut-down is needed for split runs. All this versatility without the cost of two complete conventional core blowers.

Also shown is the Sutter Automatic Transfer device which moves the blow cores from the blower to the draw machine and the Sutter Automatic Double Rollover Core Draw Machine with push out device.

more and better molds..... at lower cost

SUTTER

AUTOMATIC SHELL MOLDING MACHINES



Sutter Shell Molding Machines provide completely automatic cycle . . . feature high production capacity.

Mold quality is automatic because the cycle is automatic. Yet variable coating and curing times permit exact quality and efficiency regardless of production requirements or the nature of the shell being produced.

Another important feature of Sutter Shell Molding Machines is their flexibility. Even short run production is completely practical because set-ups are so simple to make.

Labor costs are reduced, too, because an unskilled man can efficiently operate the Sutter Automatic Shell Molding Machine.

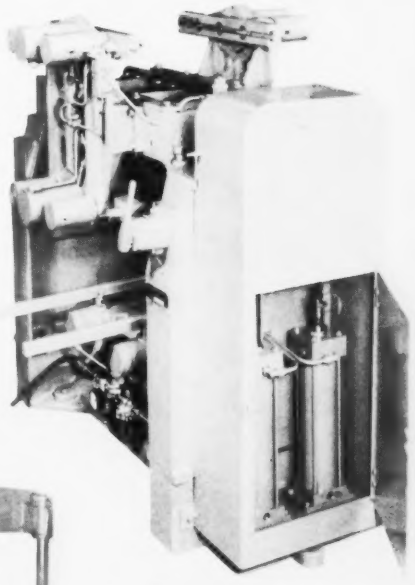
Maximum Mold size
SP-1000 . . . 20″ x 30″ x 6″ high
SP-1100 . . . 26″ x 41″ x 8″ high

INCREASE CORE QUALITY

SUTTER **AUTOMATIC CORE DRAW MACHINES *with Power Rollover***

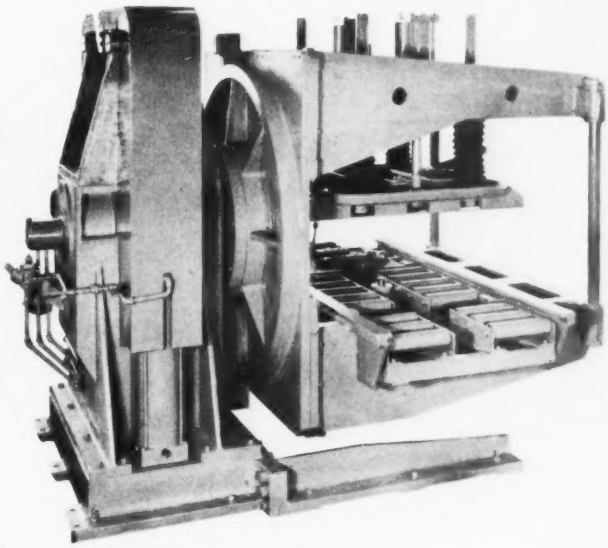
You can boost core output up to 400% with the Sutter Core Draw Machine. This has actually happened in foundries throughout the country.

Featuring power-rollover and automatic cycle, these core draw machines boost output while reducing operator fatigue . . . even unskilled operators can maintain top quality and output.

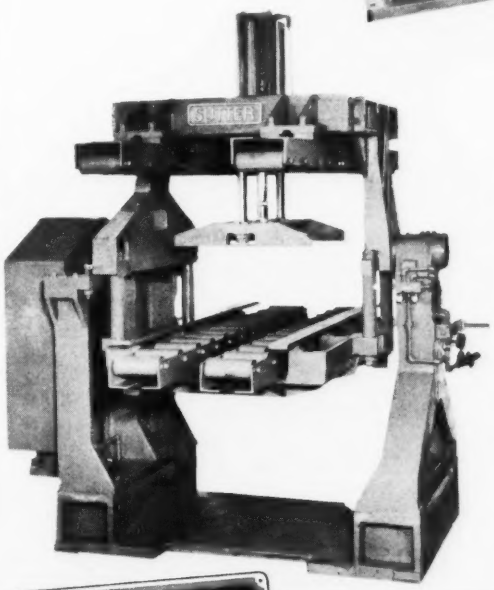


Automatic Double Rollover Core Draw Machine with side draw backs. Model SP-541. Cycle — approximately 20 seconds. Maximum Core box size 26" long x 13" wide x 10" deep

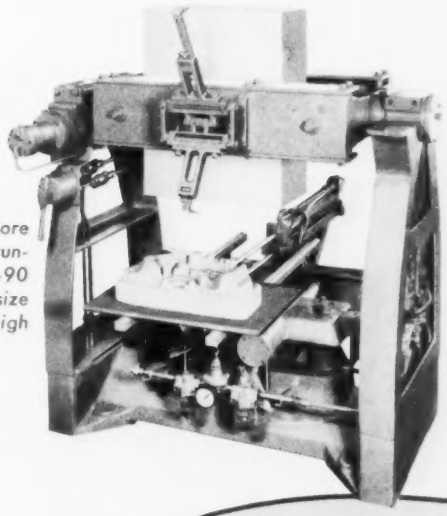
Automatic double rollover core draw machine. Automatic pushout device (Model No. SP-2020) which positions the drawn cores for easier removal. For use on all "SP-500" series machines.



Automatic single rollover core draw machine with single trunnion. Model SP-800 (three sides open). Maximum core weight—1500 lbs. Maximum core box size—50" long x 40" wide x 13" deep.



Automatic Single Rollover Core Draw Machine with double trunnion. Model SP-620. Cycle—90 per hour. Maximum core box size 38" long x 38" wide x 15" high (includes dryer)



OPERATING AT THE SHOW

SUTTER PRODUCTS COMPANY

LARGEST PRODUCER OF AUTOMATIC CORE DRAW MACHINES

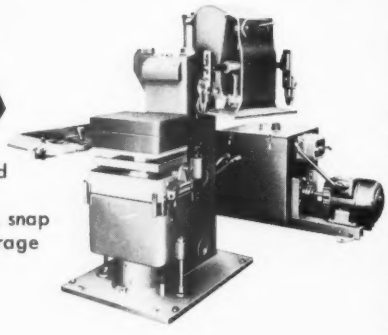
In Booths 1310-1316

SUTTER SAND HANDLING EQUIPMENT

Reduces Labor... Reduces Costs

SUTTER (F.E.) BOXLESS MOLDING MACHINES

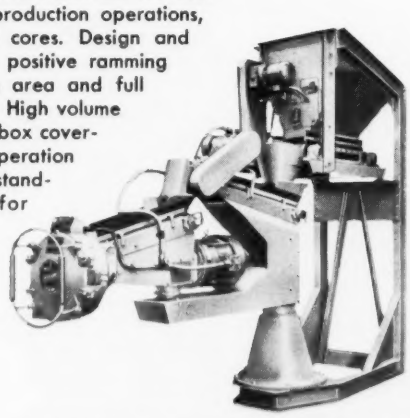
This machine is designed for production of molds for lightweight, shallow castings. Using a double faced pattern plate, copes and drags are rammed simultaneously without boxes, snap flasks or slip flasks. One man can average 100 complete molds per hour.
SP-3210—Mold size—12″ x 17″

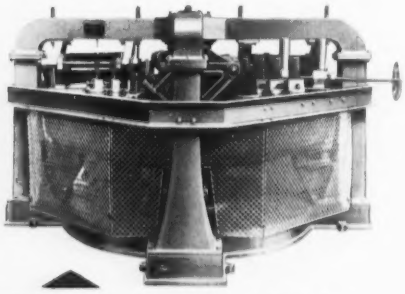


SUTTER (F.E.) SANDRAMMER JR.

Model SP-3510

You can produce better molds in less time with this versatile sandrammer. It is a compact, self-contained unit that can be used for a variety of production operations, including ramming cores. Design and construction assure positive ramming over the complete area and full depth of the mold. High volume sand output, large box coverage and simple operation make this the outstanding sandrammer for any application.

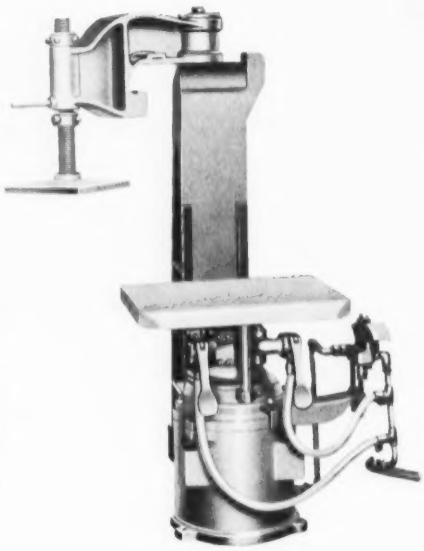




SUTTER (F.E.) SAND MILLS

continuous type Output—6 to 30 tons per hour

The design and action of these mills provide consistent, high quality molding sand . . . a perfect bond is created with any additives because every grain of sand is subjected to continuous rubbing and mixing. Sutter Sand Mills are the revolving pan type with four tapered mullers. Sand is forced in a gradual spiral to the center of the pan against centrifugal force. Equipment is also available that will permit immediate change-over to either batch or continuous milling.



SUTTER (F.E.) JOLT-SQUEEZE MOLDING MACHINE

Model SP-3010

(for snap flask molding)

Sutter (F.E.) Jolt-Squeeze Molding Machines are the foundrymen's choice for greater production and less scrap.
With a swinging pressure head and adjustable jolt stroke, this machine can be used for producing many different molds. It is safe and simple to operate. Total pressure—3 tons. Maximum pressure stroke—5⅞″. Maximum height between table and pressure plate—17½″

CORE GRINDING MACHINE AND FIXTURES

Model SP-4010

For fast, precision grinding of high production cores

In addition to the machines shown, Sutter also designs and manufactures equipment for automatic water testing of rough castings and custom-built equipment to fit your particular foundry requirements. If you want to increase your production and quality, and at the same time reduce costs, contact Sutter. Find out how the proper application of power and automaton can mean more dependable operation and more profits for you.

WRITE FOR YOUR FREE TECHNICAL BULLETIN TODAY.

Exclusive United States Sales Representative
FREDERIC B. STEVENS, INC.
Detroit 16, Michigan

Branches: Buffalo • Cleveland • Indianapolis • New Haven

Exclusive Canadian and Overseas Manufacturer and Distributor

FOUNDRY EQUIPMENT LTD.
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See us at the **FOUNDRY SHOW**

•

BOOTHS 1310-1316

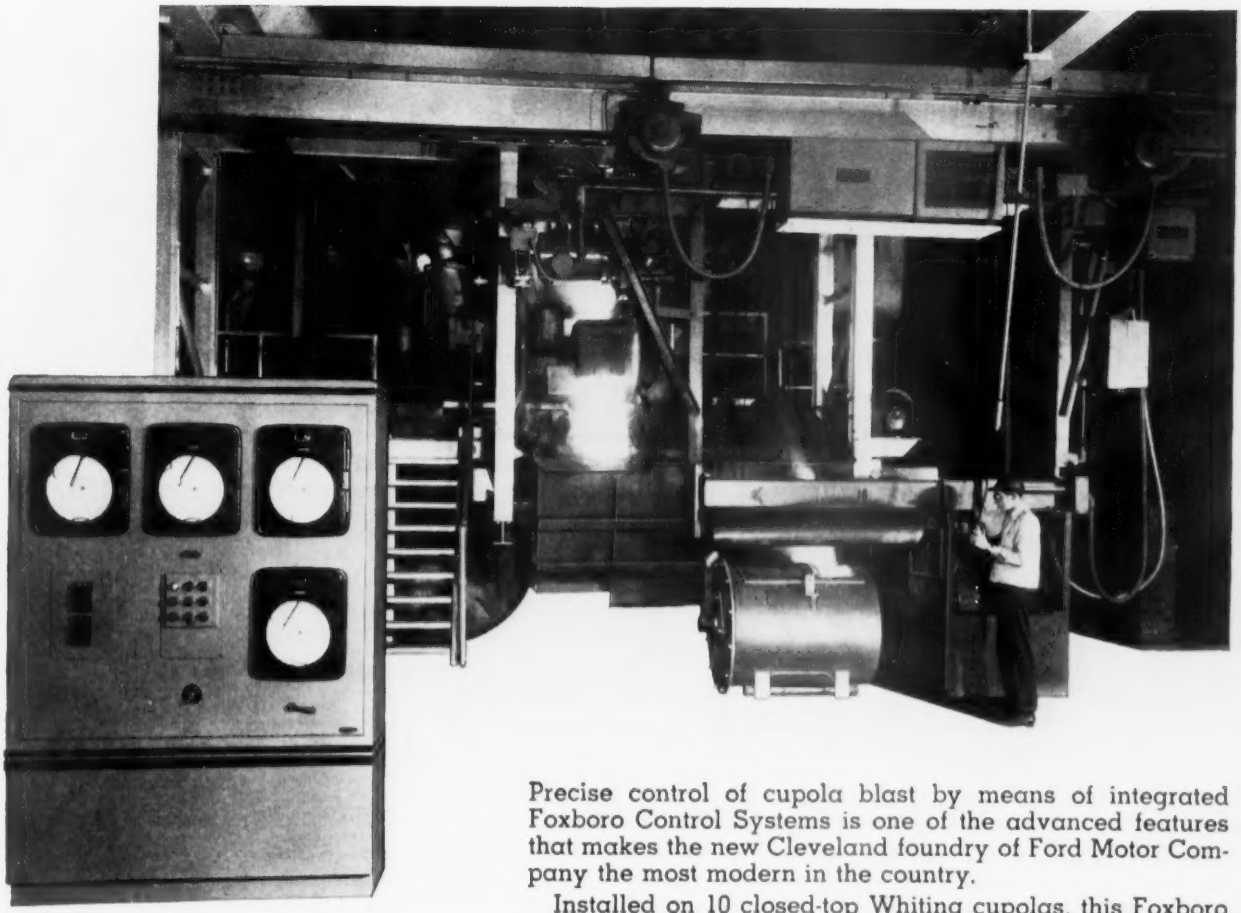
SUTTER PRODUCTS COMPANY

2005 WESTWOOD AVE. • DEARBORN, MICH.

CREATORS OF FOUNDRY EQUIPMENT WITH NEW PRODUCTIVITY

Ford's Newest Foundry Equips for Super-Efficiency

. . . with Foxboro Blast Controls



One of 5 Foxboro Instrument Systems that automatically control blast temperature and air weight for 10 Whiting cupolas in the new Ford Cleveland Foundry.

Precise control of cupola blast by means of integrated Foxboro Control Systems is one of the advanced features that makes the new Cleveland foundry of Ford Motor Company the most modern in the country.

Installed on 10 closed-top Whiting cupolas, this Foxboro Instrumentation is designed for maximum heat economy and continuous production of flawless castings. It not only controls the blast, automatically, by weight of air instead of volume . . . but also closely controls blast temperature by automatic regulation of pre-heaters, regenerators and water sprays.

Ford is one of many leading companies that have equipped their foundries with Foxboro Control. Whether you need an integrated system, or simple instrumentation for your present cupolas, Foxboro Air Weight Control can improve the economy and quality of your production.

THE FOXBORO COMPANY, 325 NEPONSET AVE., FOXBORO, MASS., U. S. A.

FOXBORO REG. U. S. PAT. OFF. CONTROL SYSTEMS

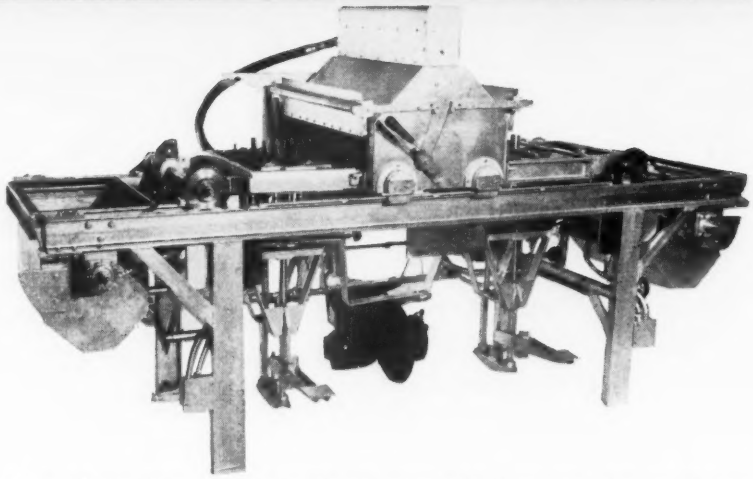
FACTORIES IN THE UNITED STATES, CANADA AND ENGLAND

THE CHOICE OF LEADING FOUNDRIES FOR LOW PRICED SHELL MOLDING MACHINES

NEW — Types and sizes of shell molding machines. Proven performance with low initial cost.

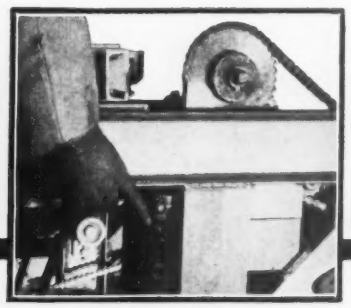
DESIGN — Extremely rigid and quality-built to exacting standard. One operator will perform two operations on a single machine.

FEATURES — 3 outstanding improvements for production-wise foundrymen. Check these features for yourself.



13 x 24 machine shown with all new add features. All machines have pattern heating units as part of equipment. Machines will operate with any type gas.

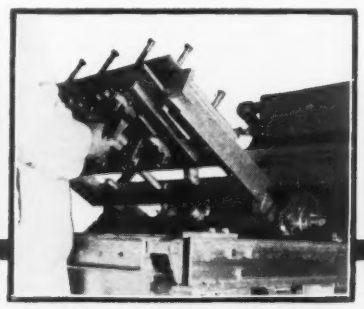
1



SEMI-AUTOMATIC

SEMI-AUTOMATIC — At the push of a button your pattern plate (which is gas heated at all times) is rotated 180° clockwise, to top of investment box — both rotate and lock automatically still moving clockwise another 180° and invests. Timer now takes over (which can be set for any length investment). After investment is complete it automatically reverses itself 360° to starting position. Time of complete rotation from start to finish (including a 15 second investment) is 23 seconds. During this operation another shell is being cured at opposite end of the machine.

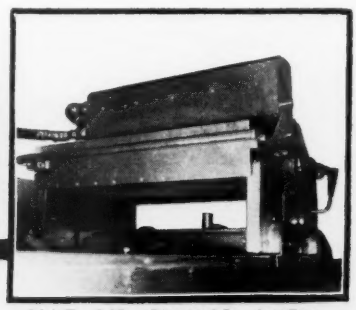
2



10 MIN. PATTERN CHANGE

QUICK PATTERN PLATE CHANGING — Pattern equipment can now be changed in a maximum time limit of ten (10) minutes. Interchangeable pattern frames and gas heating burners are now available (optional) which will enable you to prepare your next job in these extra frames. Complete jobs including pins, springs and gas heating burners may be stored until further use. Pattern frames are machined and ground to close tolerances for accurate interchangeability.

3



HOT AIR CURING OVEN

HOT AIR CURING OVEN — Now your shells are cured with hot air in the new TYCO oven. The hot air cures faster and more evenly throughout the shell. Heat temperature can be accurately maintained in the range of 600°F. to 1000° F. Patterns with straight walls or height will be cured without any burning effect or warpage. Shells being cured are never exposed to gas flame but are cured in a ninety (90) changes per minute hot air chamber. These many air changes carry away resin fumes.

If you are now shell molding or planning to go into shell molding it will pay to visit TYCO BOOTH No. 1027, May 8 to May 14, at the 1954 Foundry Show, Cleveland, Ohio. See for yourself the many exclusive features which we have incorporated into our machines. These machines will be in actual operation during the Foundry Show. If you are going to miss the Foundry Show feel free to write us for our descriptive literature prepared specially to give you full description, specifications and prices.

TYLER METAL PRODUCTS COMPANY

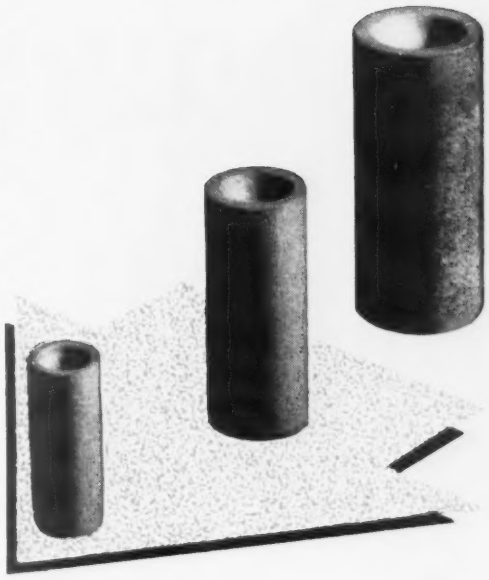
1101-03 TYLER STREET • ST. LOUIS 6, MO., U. S. A.

TOOLS - DIES - STAMPING - JIG - FIXTURES

ENGINEERING DESIGNING EXPERIMENTAL MODEL MAKING SHELL MOLDING

Leading Foundries Use...

NORBIDE® Nozzles



Because . . .

- They get more service per dollar cost (750 hours silica sand — 1500 hours steel shot or grit). NORTON guarantees this minimum service.
- Their air consumption is reduced from 10 to 20 per cent as compared with iron nozzles.
- They maintain stream contour and abrasive velocity.

For full details on cost-cutting NORBIDE Nozzles, write for your free copy of Form 543.

NORBIDE®... *the longest nozzle life you can buy*

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Making better products . . . to make other products better

32-YEAR-OLD QUINTUPLETS GREW UP AT 2500°

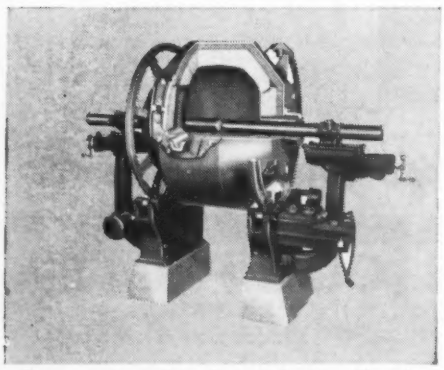
5 DETROIT ROCKING ELECTRIC FURNACES FOR EVERDUR INGOT PRODUCTION AT DETROIT PLANT OF AMERICAN BRASS

Melting tough Everdur alloy calls for a furnace that can produce uniform results at high, controlled temperatures. To meet these requirements, the American Brass Company installed five Detroit Electric Furnaces in their Detroit Plant back in 1921. Today, these 'quints' are still in the foundry. Two of them run 16 to 24 hours per day turning out huge 6300-lb. ingots of Everdur.

The dependability of Detroit Rocking Electric Furnaces—at American Brass and in plants throughout the world—is measured in both furnace performance and melt results. They give years of economical, trouble-free service and deliver metal of consistent quality through heat after heat. Sound design plus many exclusive engineering features account for this dual dependability.

Detroit's indirect arc heat provides fast, controlled melting of ferrous or non-ferrous metals while holding alloy variation and carbon pick-up to a minimum.

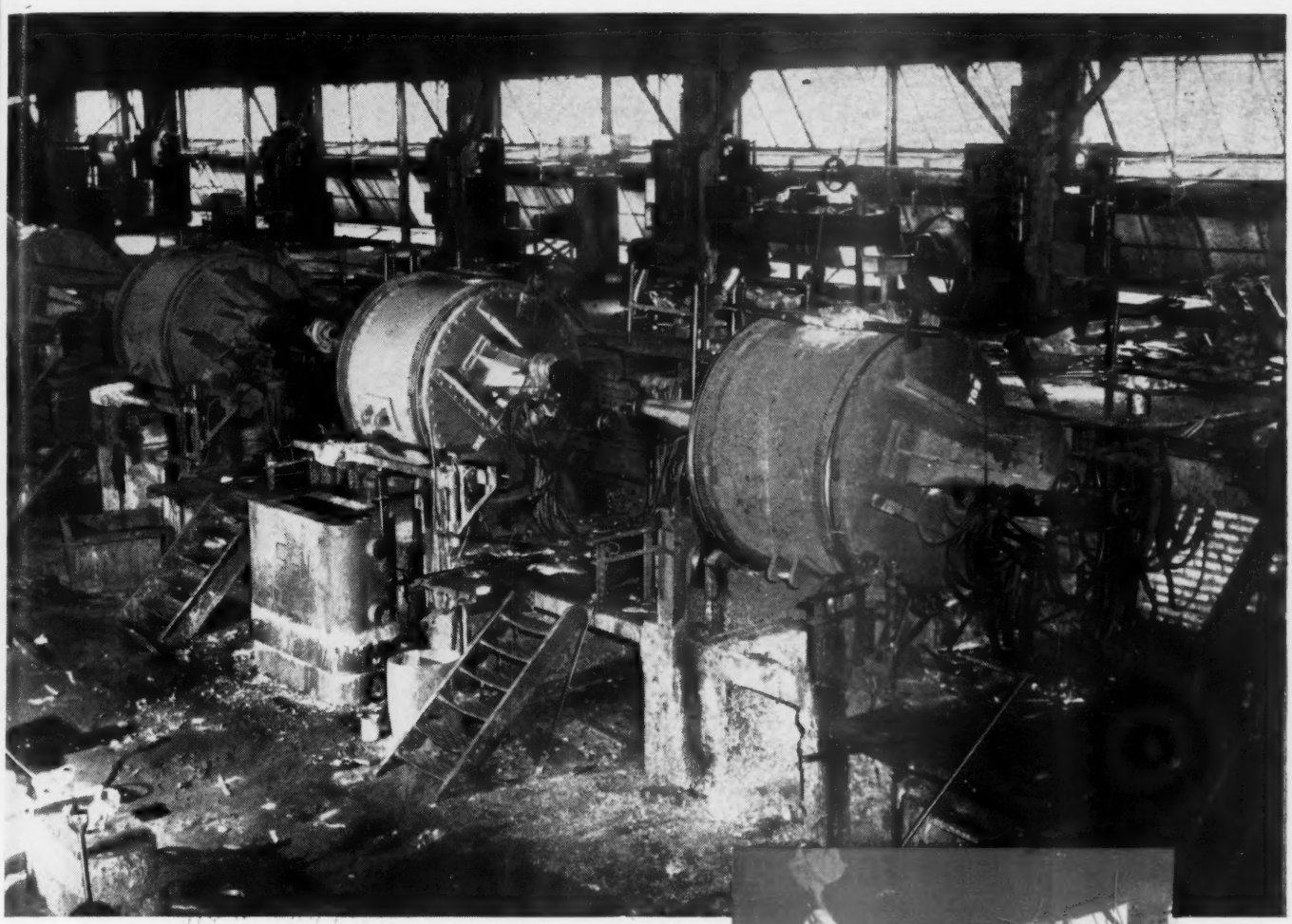
Controlled rocking action of Detroit Electric Furnaces has many advantages. The molten metal is



Cutaway view of the Detroit Rocking Electric Furnace, showing engineering and construction features. Rocking action assures maximum heat utilization.

DETROIT ELECTRIC

Kuhlman Electric Company



Pouring a 6300-lb. ingot of Everdur at American Brass. Ladle and furnace pour simultaneously to assure uniform hardening.

washed over a large area of the refractory for greater utilization of heat and longer refractory life. And constant motion assures homogeneity of the metal. With automatic rocking control, the most favorable melting cycle can be duplicated, assuring uniform melts at optimum power consumption.

Economy features include less metal shrinkage; more usable metal per heat; less down time because of longer refractory life, easy shell replacement.

Write today for full information on Detroit Electric Furnaces and how they can do a better job for you.

Furnace capacities from 10 to 4000 pounds.

FURNACE DIVISION

Bay City, Michigan

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CLEVELAND, OHIO — MAY 8-14, 1954

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FOUNDRY TESTED AND APPROVED
MANUFACTURED UNDER SCIENTIFIC CONTROL

DELTA products for the foundry are PRODUCTS OF RESEARCH. For nearly twenty years many important scientific developments . . . valuable contributions to the advancement of foundry practices . . . have originated in DELTA'S laboratories where the most modern scientific facilities are employed in a continuing program of product research, development and standardization.

Every DELTA Foundry Product is first tested by laboratory methods then submitted for use and final approval in ACTUAL FOUNDRY PRACTICE before it is identified with the name "DELTA".

There is no "just as good" substitute for ANY Delta Foundry Product just as there is no substitute for DELTA'S scientific controls which safeguard the quality and uniformity of all DELTA Foundry Products.

FOR SAND

DELTA Permi-Bond (sea coal replacement)

Sand Conditioning Oils

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DELTA Core & Mold Washes for steel, malleable, gray iron and non-ferrous metals.

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Core Oils

Partex (Nut Shell Parting)

Liquid Parting

Bondite

FOR MOLDS

DELTA Core & Mold Washes for steel, malleable, gray iron and non-ferrous metals.

Partex (Nut Shell Parting)

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FOR FASTER PRODUCTION OF BETTER, CLEANER CASTINGS AT LOWER COST

DELTA

Get the Facts...

Delta Technical Men will be at the booth to answer your questions and discuss with you problems relative to foundry practice. Working samples and complete literature on Delta Foundry Products will be sent to you on request for test purposes in your own foundry.

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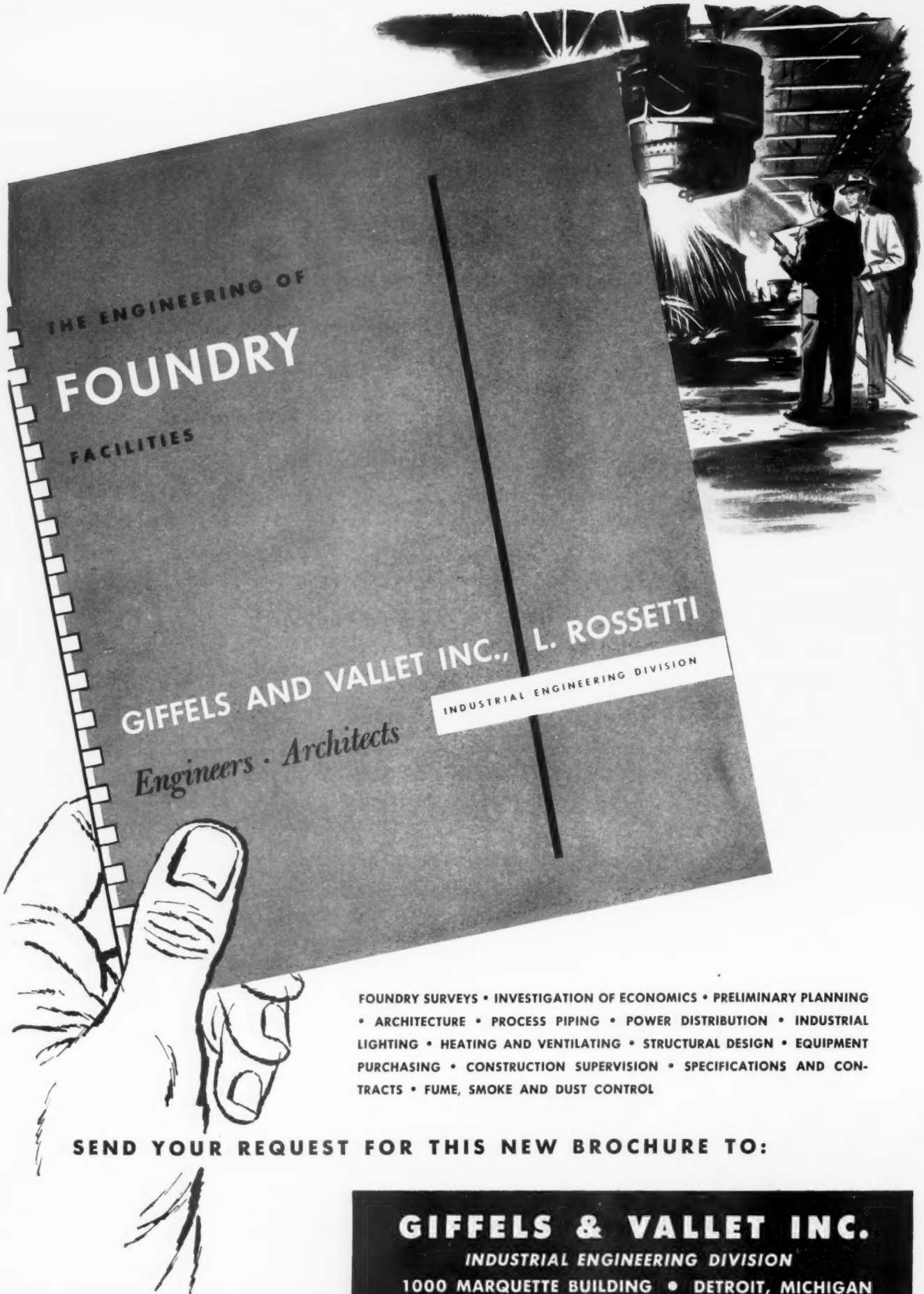

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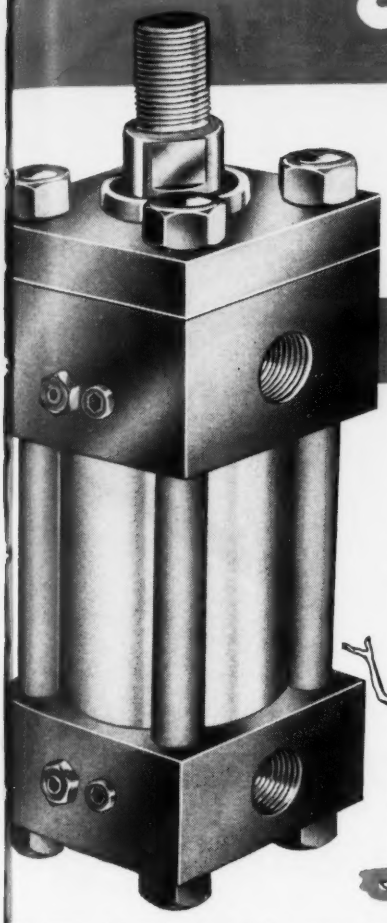
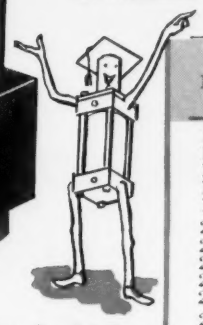


Any of the interchangeable mountings illustrated can be easily attached to Basic Model 53 by tie rod nuts in a few moments by any customer. This gives you a wide selection of models for original equipment and for convenient re-use with other mounting attachments to simplify your "stock" and maintenance problems.

ORDER DIRECTLY FROM THIS LIST...

"Stock" Cylinders are shipped as Basic Model 53. Your selection of Mounting Attachments are shipped (unattached) with cylinders. Prices are F.O.B. our plant.



			BASIC CYLINDER PRICES ONLY		PRICES OF MOUNTING ATTACHMENTS ONLY						
			Basic Model 53 — Tie Rods Extended Rod End		Side or Foot Mounting (71)	Foot Mounting (77)	Rod End Flange (61)	Cap End Flange (62)	Rod End Flange (65)	Cap End Flange (66)	Pivot Mounting (86)
Bore	Stroke	Cushion	AIR A53	HYD. H53	AIR A77 A71	HYD. H77 H71	AIR A61 A62	HYD. H61 H62	AIR A86	HYD. H65 H66 H86
1½"	2"	Non		$58.50		$2.90		$8.20		$14.35
1½"	4"	Non		60.70		2.90		8.20		14.35
1½"	6"	Non		62.90		2.90		8.20		14.35
1½"	8"	Non		65.10		2.90		8.20		14.35
1½"	11"	Non		68.40		2.90		8.20		14.35
2"	2"	Non	$37.70		$2.05		$4.60		$6.90	
2"	4"	Non	39.40		2.05		4.60		6.90	
2"	6"	Non	41.10		2.05		4.60		6.90	
2"	8"	Non	42.80		2.05		4.60		6.90	
2"	11"	Non	45.35		2.05		4.60		6.90	
2"	3"	Both	62.05	94.50	2.05	2.95	4.60	8.55	6.90	17.05
2"	5"	Both	63.75	97.00	2.05	2.95	4.60	8.55	6.90	17.05
2"	7"	Both	65.45	99.50	2.05	2.95	4.60	8.55	6.90	17.05
2"	9"	Both	67.15	102.00	2.05	2.95	4.60	8.55	6.90	17.05
2"	13"	Both	70.55	107.00	2.05	2.95	4.60	8.55	6.90	17.05
2½"	2"	Non	41.45	73.30	2.25	2.95	4.80	9.00	7.55	19.80
2½"	4"	Non	43.35	76.00	2.25	2.95	4.80	9.00	7.55	19.80
2½"	6"	Non	45.25	78.70	2.25	2.95	4.80	9.00	7.55	19.80
2½"	8"	Non	47.15	81.40	2.25	2.95	4.80	9.00	7.55	19.80
2½"	11"	Non	50.00	85.45	2.25	2.95	4.80	9.00	7.55	19.80
3¼"	3"	Both	77.80	126.85	2.55	4.35	6.35	11.75	9.90	23.10
3¼"	5"	Both	79.80	129.85	2.55	4.35	6.35	11.75	9.90	23.10
3¼"	7"	Both	81.80	132.85	2.55	4.35	6.35	11.75	9.90	23.10
3¼"	9"	Both	83.80	135.85	2.55	4.35	6.35	11.75	9.90	23.10
3¼"	13"	Both	87.80	141.85	2.55	4.35	6.35	11.75	9.90	23.10
4"	2"	Non	56.25	106.00	2.85	5.15	6.70	12.90	11.05	26.80
4"	4"	Non	58.85	109.40	2.85	5.15	6.70	12.90	11.05	26.80
4"	6"	Non	61.45	112.80	2.85	5.15	6.70	12.90	11.05	26.80
4"	8"	Non	64.05	116.20	2.85	5.15	6.70	12.90	11.05	26.80
4"	11"	Non	67.95	121.30	2.85	5.15	6.70	12.90	11.05	26.80
5"	3"	Both	98.25		3.15		7.00		12.35	
5"	5"	Both	101.65		3.15		7.00		12.35	
5"	7"	Both	105.05		3.15		7.00		12.35	
5"	9"	Both	108.45		3.15		7.00		12.35	
5"	13"	Both	115.25		3.15		7.00		12.35	
6"	2"	Non	80.60		3.35		7.25		13.55	
6"	4"	Non	84.90		3.35		7.25		13.55	
6"	6"	Non	89.20		3.35		7.25		13.55	
6"	8"	Non	93.50		3.35		7.25		13.55	
6"	11"	Non	99.95		3.35		7.25		13.55	
8"	3"	Both	157.35		3.70		10.55		17.60	
8"	5"	Both	162.45		3.70		10.55		17.60	
8"	7"	Both	167.55		3.70		10.55		17.60	
8"	9"	Both	172.65		3.70		10.55		17.60	
8"	13"	Both	182.85		3.70		10.55		17.60	

Miller "Stock" Cylinders fully meet the J.I.C. standards and are identical to Miller "Custom-Built" Cylinders in design and construction.

"Stock" Air Cylinders are for 200 psi operation, "stock" hydraulic cylinders for 2000-3000 psi operation. Piston Rods of "Stock" Cylinders are "Style No. 2 Standard."

For complete descriptive and dimensional data on both "Stock" and "Custom-Built" Miller Cylinders, write for Bulletins A-105 and H-104 sent FREE on request.

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Complete Miller "custom-built" line includes: air cylinders, 1½" to 20" bores, 200 psi operation; low pressure hydraulic cylinders, 1½" to 6" bores for 500 psi operation, 8" to 14" bores for 250 psi operation; high pressure hydraulic cylinders, 1½" to 12" bores, 2000-3000 psi operation. All mounting styles available. Also, a complete line of Fluid Pressure Boosters and Accumulators.

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M-10

M-10 the 'national' DUAL PURPOSE FLUX

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IN THE LADLE . . . M-10 increases fluidity materially by cleansing and purifying the metal, bringing to the surface occluded oxides, gases, slag, dirt, etc., offsetting the negative factors of inferior scrap and coke.

AS A 'HOT TOPPING' . . . M-10 prevents oxidation by keeping molten steel down into the main body of the ingot, greatly reducing volume of piping and saving a substantial amount of metal. There is no carbon segregation or pickup.

ON BLIND AND OPEN RISERS . . . M-10 raises the temperature of the metal to a higher degree and substantially increases and maintains the fluidity of the metal during the entire cooling-down period.

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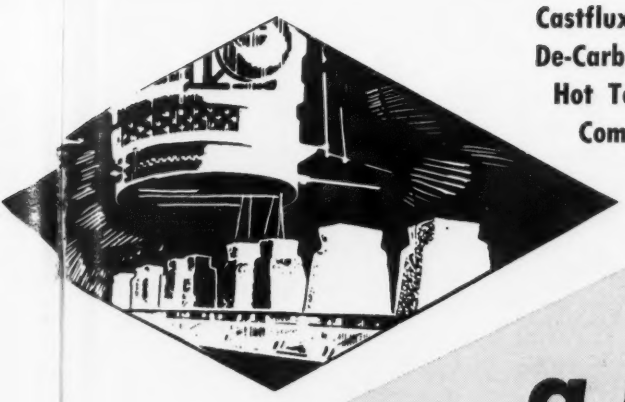
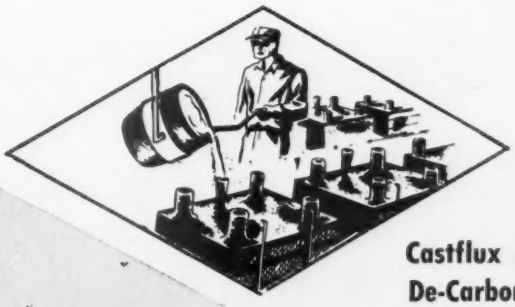


Castflux M-10
De-Carbonized
Hot Topping
Compound



Castflux M-10
De-Carbonized
Riser Compound

a new

DE-CARBONIZED*

HOT TOPPING AND RISER

COMPOUND

used on steel and malleable castings and ingots

Years of laboratory research and months of actual field testing have proven the superiority of CASTFLUX M-10 over most hot topping or riser compounds on the market today. The less than 3% carbon content of M-10 once and for all precludes any carbon pickup, segregation or contamination in any steel or steel alloys, and permits the control of carbon content in your metal without variation.

Depending on the size of the head, various tests have shown as much as 25% reduction in the depth of the piping, resulting in more solid metal in your ingot.

CASTFLUX M-10 will feed more riser metal into the main body of the casting and materially reduce any undesirable shrink, both internal and over-all.

As a ladle covering, CASTFLUX M-10 retains the pouring temperatures of the metal for a far longer period, thus permitting short pouring, and substantial saving of remelt metal.

That DE-CARBONIZED CASTFLUX M-10 will increase the yield and improve prodution at considerable savings has been conclusively proven. You, too, will benefit by a test-trial.

unconditionally GUARANTEED

Unless Castflux meets with your full approval, material can be returned at no expense within 30 days.

* less than 3% carbon content

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High Speed SMALL

T-4134
A distributing ladle receives molten metal from the tea-pot mixing ladle

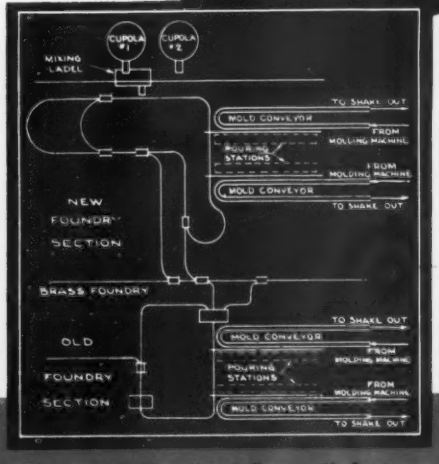
Every Foundry of Every Type and Size Can Profit with CLEVELAND TRAMRAIL

Hundreds of foundries from the smallest to the largest are now enjoying the many advantages that Cleveland Tramrail provides.

Regardless of your problem, if it's handling materials, Cleveland Tramrail can help you. And even if you do not have a problem, you should get the facts on what Cleveland Tramrail can do for you and plan now for the future.

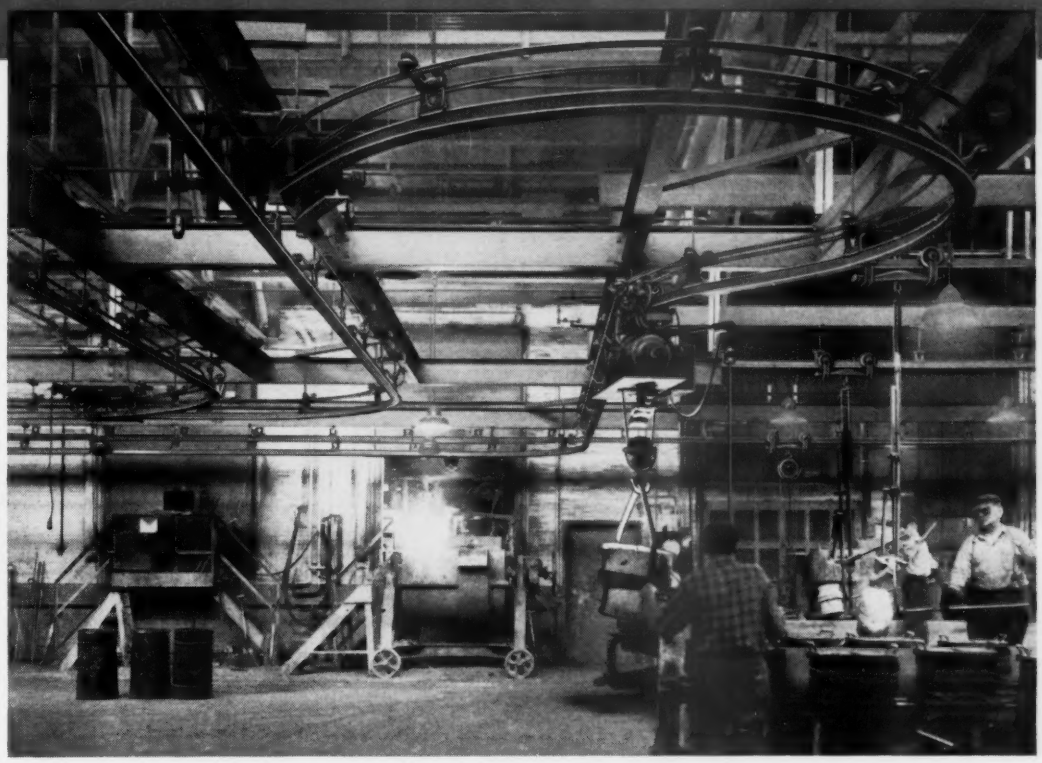
T-4135
The distributing ladle is transported to one of the mold conveyors where the metal is transferred to a pouring ladle. Note both of these ladles ride on hand-propelled overhead Cleveland Tramrail carriers. An electric hoist raises and lowers the distributing ladle. A lever arrangement changes the elevation of the pouring ladle.

T-4136
The molds are poured on the mold conveyor as they pass this station. Although pouring continues all day long at a rapid rate, there is no running helter-skelter or inefficient steps, because molds and metal are brought together here by efficient conveying methods.



Layout of Cleveland Tramrail System

CASTING PRODUCTION



T-4132
View of overhead rail system serving the two mold conveyors in new foundry section. This is only a part of the extensive Cleveland Tramrail system in this modern foundry

For Tops in Production, Study This Clean, Orderly, Efficient Layout

For the production of small and medium castings, a combination of Cleveland Tramrail equipment and continuous mold conveyors is providing outstanding advantages for an Eastern foundry. Top efficiency is obtained and confusion and lost time reduced to a minimum.

There are four continuous mold conveyors which travel through the molding departments where the molds are received directly from the molding machines. Each conveyor has one man whose sole task is to pour the molds. A second man shifts the weights.

40 tons of grey iron are poured per 9-hour day. The metal is conveyed from the furnace to the pouring stations by the overhead Cleveland Tramrail system. One distributing ladle with operator is required to supply each mold conveyor where the metal is transferred to the small pouring ladles which also ride on tramrail carriers.

This is a high speed production foundry. It is clean and orderly and every detail systematized. Each man has a specific job. Because of the modern facilities provided he handles his work with ease and dispatch. His every step has been carefully planned for maximum efficiency and he cannot deviate from the routine established.

The mold conveyors set the production pace. This is slow enough so that the pourer can fill all molds and have sufficient time to refill his ladle. If for any reason the conveyor is moving too fast, it can be stopped temporarily.

Cleveland Tramrail equipment was originally installed in 1928 to serve the first two continuous mold conveyors put into operation. Because of its satisfactory performance Cleveland Tramrail was again chosen to serve two additional conveyors when installed in 1941.

CLEVELAND TRAMRAIL

DIVISION OF

THE CLEVELAND CRANE & ENGINEERING CO.

3803 East 286th Street — Wickliffe, Ohio

THERE IS A SOLUTION TO YOUR COSTLY... *Foundry Problems..*

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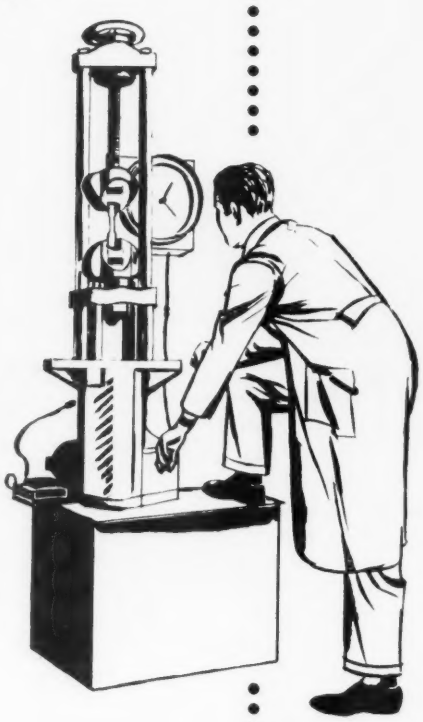

When you call upon
LAVIN'S ENGINEERING SERVICE

QUALITY CONTROL IS THE GOAL OF EVERY FOUNDRYMAN . . .

The quality of castings is governed by proper melting procedures, accurate gating and risering, directional solidification and choice of suitable alloy required for any designated application.

Test bars and other scientific methods are being constantly employed in our research laboratories in order to insure the high standards required by the nonferrous industry.

Lavin's metallurgical staff is always ready to assist the foundryman in finding the solution of any routine or special casting problem. Our chemical and research laboratories are available to you at no cost or obligation.

Next time call upon LAVIN'S engineering service

"The Foundryman's Problems Are Our Problems"

FREE—WRITE FOR YOUR COPY OF THE 8 PAGE LAVINGOT TECHNICAL JOURNAL VOL. 9, NO. 4, CONTAINING A COMPLETE ARTICLE ENTITLED—"GATES & RISERS FOR MANGANESE BRONZE"

RESEARCH — CONTROLLED REFINING INSURE UNIFORM QUALITY

• REFINERS OF BRASS, BRONZE AND ALUMINUM • PRODUCERS OF ZINC BASE DIE CASTING ALLOYS • DEOXIDIZERS . . . DEGASIFIERS . . . FLUXES . . . SHOTS • CAST VIRGIN ELECTROLYTIC COPPER ANODES • TYPE METALS.

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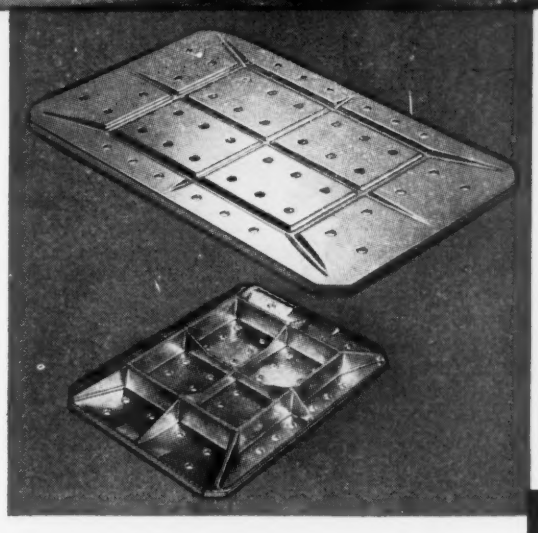
R. LAVIN & SONS, INC. 1900 54 Years 1954 SERVING THE FOUNDRY INDUSTRY

"Rejects have been reduced to an absolute minimum since using EDCO Dowmetal BOTTOM BOARDS"

says BOB PETCHER
FOUNDRY SUPERINTENDENT
JOSAM MFG. CO., MICHIGAN CITY, IND.

EDCO DOWMETAL Bottom Boards in use at Josam Manufacturing Company, world's largest manufacturer of plumbing drainage products



"Light, easy to handle, practically everlasting, EDCO DOWMETAL Bottom Boards have been a potent factor," says Petcher, "in improving our quality of castings and increasing our output.

"Our old wood boards had a life of about two weeks; and toward the end of their life-span, they always produced some poor castings which had to be rejected.

"EDCO Boards are just the opposite—they are *permanent equipment.* We've been using EDCO DOWMETAL Bottom Boards for more than four years—have used them almost 10,000 times—and they are still in perfect condition.

"These boards have paid for themselves many times over."

You, too, can save time, space and substantial cash sums by using EDCO DOWMETAL Bottom Boards.

They're easy to handle—light. They stack in small space, easily and securely. They last indefinitely—built for it.

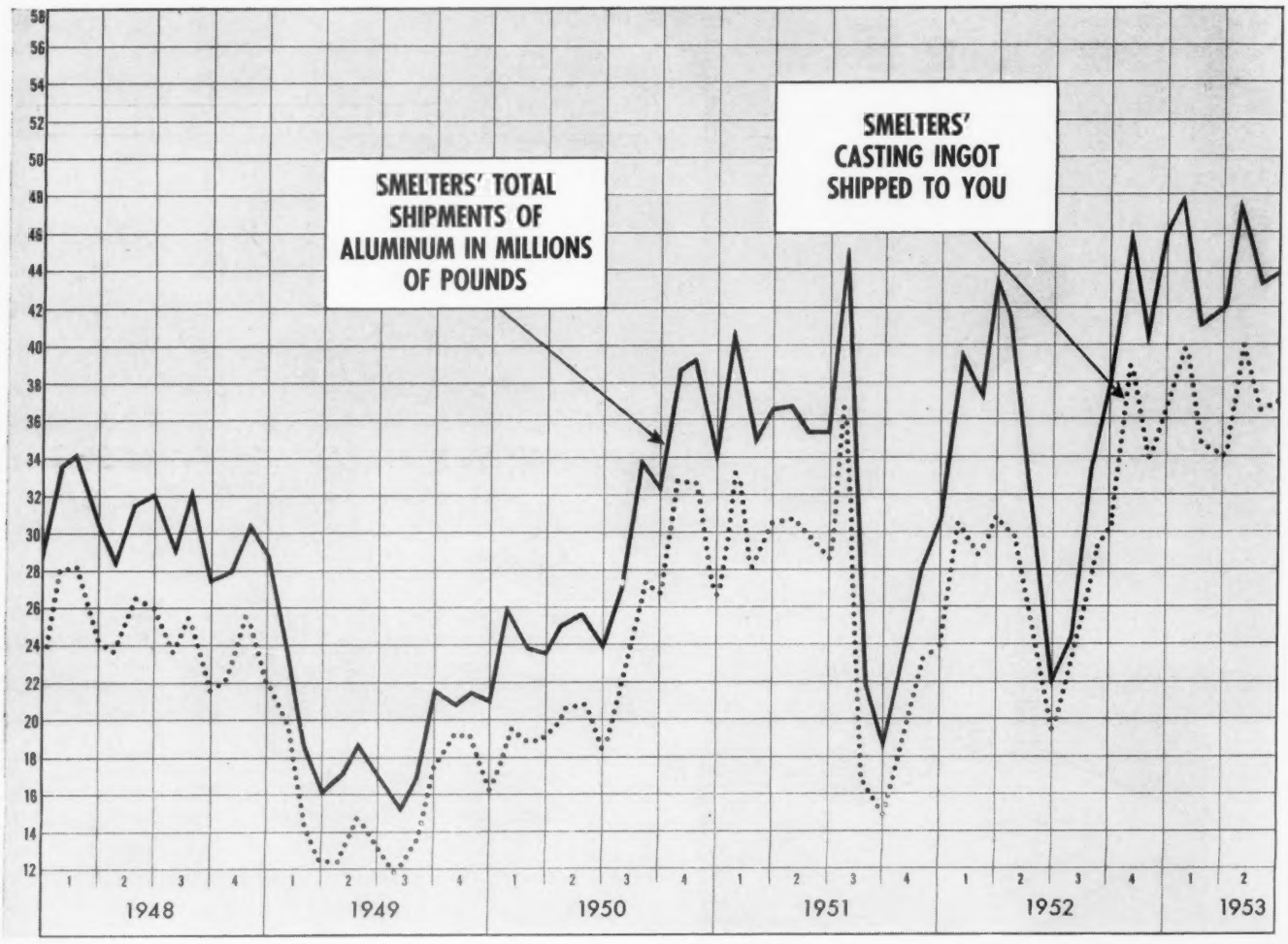
Above all, like Josam, you get better castings, fewer rejects—a big saving.

Write us, or phone MAnsfield 6-7330 for price schedule and list of 78 standard sizes available from stock.

CHRISTIANSEN CORPORATION

210 SOUTH MARION ST.
OAK PARK 1, ILLINOIS
ALUMINUM ALLOY INGOTS

NO FOUNDRY EVER SHUT DOWN FOR LACK OF SMELTERS ALUMINUM!



Why? Because 80% of the smelters' business is furnishing you with aluminum casting alloys. Look at the chart—it shows Bureau of Mines figures on smelters' shipments of all products and shipments of casting ingot to your shops by smelters. You see that shipments of smelters ingot go hand in hand with the needs of the foundry and die casting shops year after year. This performance record is your insurance policy against high inventory costs and costly work stoppages. It is our proudest boast that *no foundry or die caster ever shut down because he couldn't get aluminum ingot from the smelters*—especially when the demand for aluminum was greatest.

We've shipped ingot that was still almost too hot to handle. But, we delivered! In many cases, only *hours* after receiving an emergency call the aluminum smelter's shipment was sitting in your shop. We're proud of that service. We're proud, too, that we've kept pace with the ever increasing complexity of your requirements—that we've developed the alloys you need—constantly improved the quality of our products and supplied you with technical assistance which has many times provided the answers to problems before they have arisen in production. In short, we are alert at all times *to fill your needs*—because you are our biggest customer.

And, just as you would never fail to care for and protect the customers who provide you with 80% of your business, you know that the smelters are going to care for and protect your business.

They are your constant and dependable source of supply.

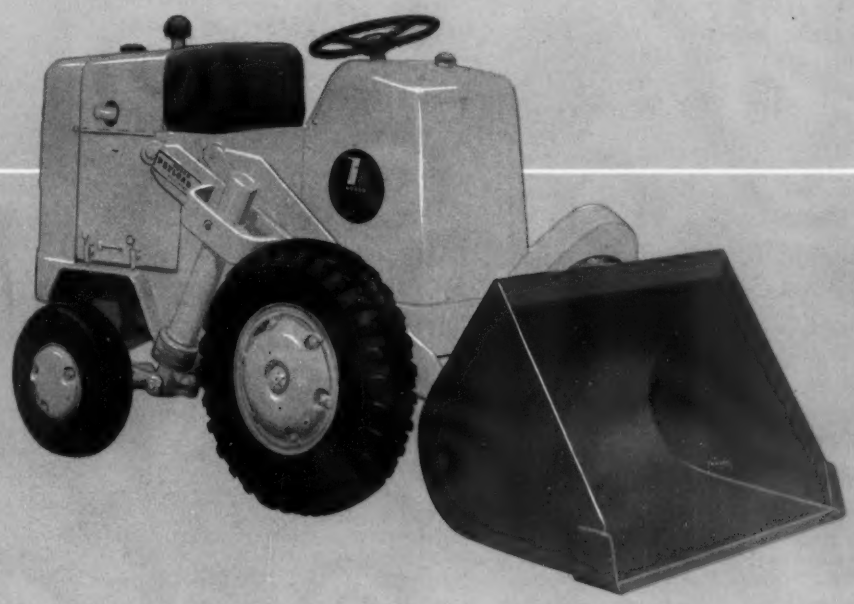
no foundry ever shut down because ingot was not available from smelters!

ASR

Aluminum Smelters Research Institute
20 North Wacker Drive, Chicago 6, Illinois

NOW

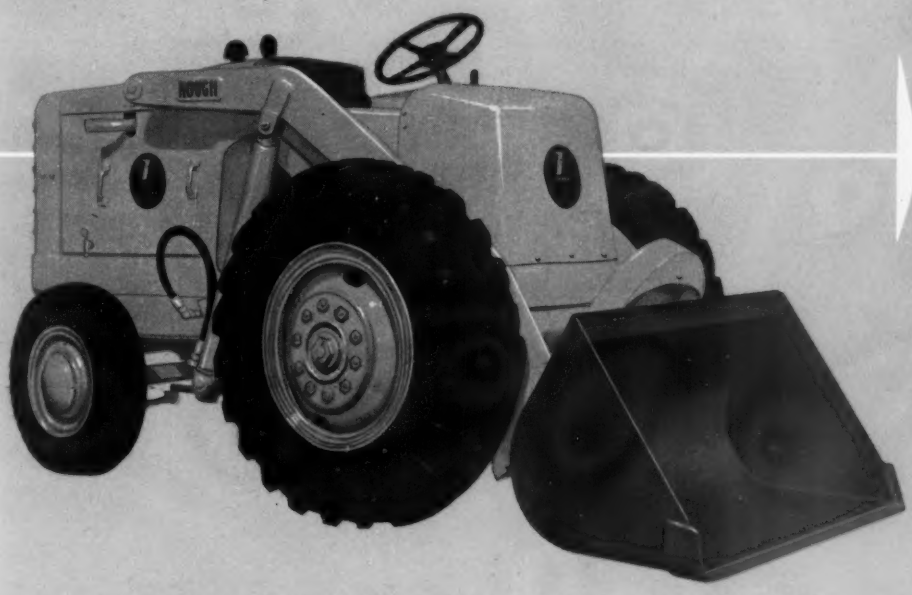
GREATER OUTPUT FROM TWO FAMOUS PAYLOADER® MODELS



NEW..

TORQUE CONVERTER DRIVE ON MODEL HA

12 CU. FT. CAPACITY (STRUCK-LOAD)
16 CU. FT. CAPACITY (PAYLOAD)



NEW..

TORQUE CONVERTER DRIVE ON MODEL HAH WITH POWER STEERING

18 CU. FT. CAPACITY (STRUCK-LOAD)
24 CU. FT. CAPACITY (PAYLOAD)

Greater Output · Easier Handling · Lower Upkeep

Details on other side

NEW Torque Converter Drive Multiplies PAYLOADER® Output

FASTER OPERATION

Torque Converter *automatically* selects highest operating speed in relation to the load.

INFINITE SPEEDS

4-speed transmission, plus Torque Converter, provides an infinite number of operating speeds.

EASIER OPERATION

Torque Converter, by multiplying torque without changing gears, simplifies operators work.

PRECISE CONTROL

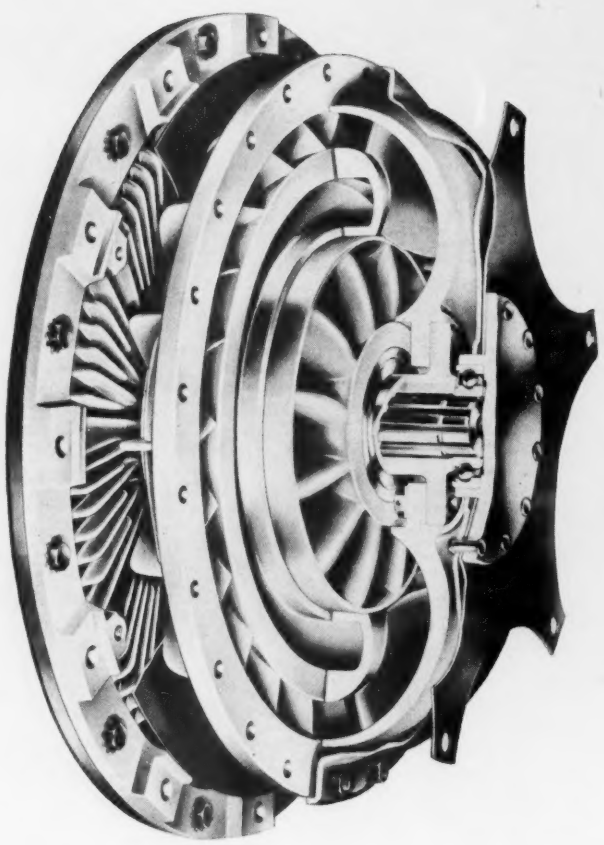
"Pinpoint" control for close maneuvering by accelerator only. Clutch slipping is eliminated.

FULL ENGINE POWER

Engine operates at most efficient speed. Eliminates stalling and delays waiting for power pick-up.

LOWER MAINTENANCE

Cushion of oil absorbs load shocks prolongs life of entire drive assembly. Less down-time results.



Heavy duty, precision-built combination torque converter—fluid coupling multiplies torque up to 2.1 times for starts and heavy loads...it is an efficient fluid coupling when loads are light.

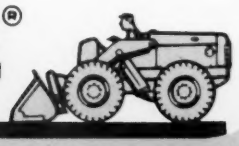
WRITE for information regarding these new models, or any of the front-wheel, rear-wheel or four-wheel-drive models. Payload (heaped) capacities from ½ to 2 cubic yards.

THE FRANK G. HOUGH CO.
703 Sunnyside Ave., Libertyville, Illinois

SAY "HUFF"

PAYLOADER®

THE FRANK G. HOUGH CO. • *Since 1920*



Illustrated above, an enlargement of used foundry sand reclaimed by the Nichols High Temperature System.

A check worth thousands!

The reclaimed sand grains shown above represent the thousands of dollars your foundry can save by using a Nichols sand reclamation system. Now is the time to check the facts with us. We shall be glad to show you actual proof of these savings.

Write today for more information.

Nichols Engineering & Research Corp.
70 Pine St., New York 5, N. Y.
1637 N. Meridian St., Indianapolis 2, Ind.
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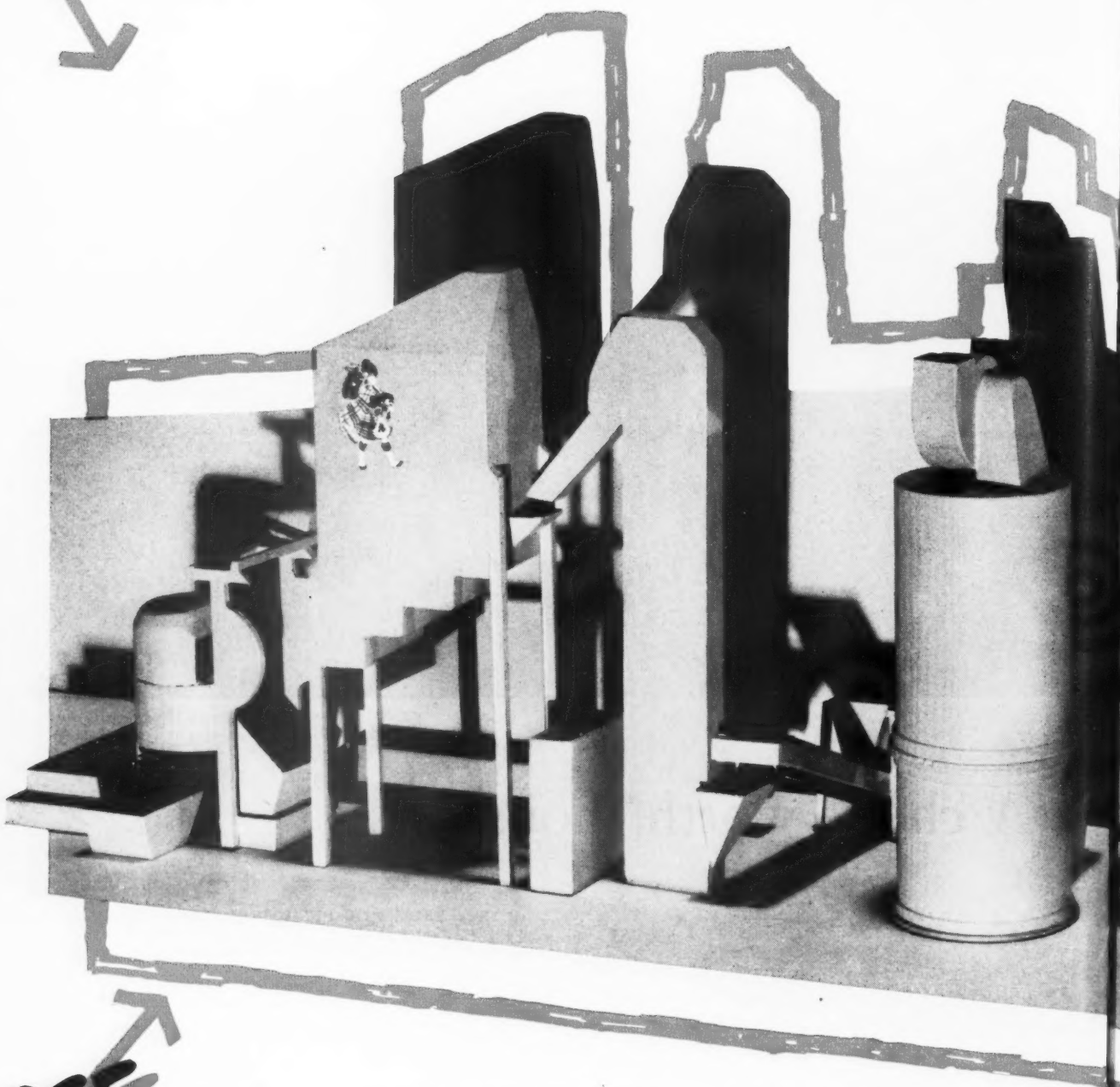
1477 Sherbrooke St., W., Montreal 25, Canada

Nichols
Sand Reclamation Systems

SEE

MODERN SAND RECOVERY PROVEN



SEE

WASTE SAND RECLAIMED, REBONDED and RETURNED for reuse in cores for production use at two leading Cleveland foundries. A National Sand Recovery Unit will reclaim it . . . a National Hydro Filter will collect all fines and waste material . . . a New Simpson No. 1 Model F Mix-Muller will rebond the reclaimed sand.

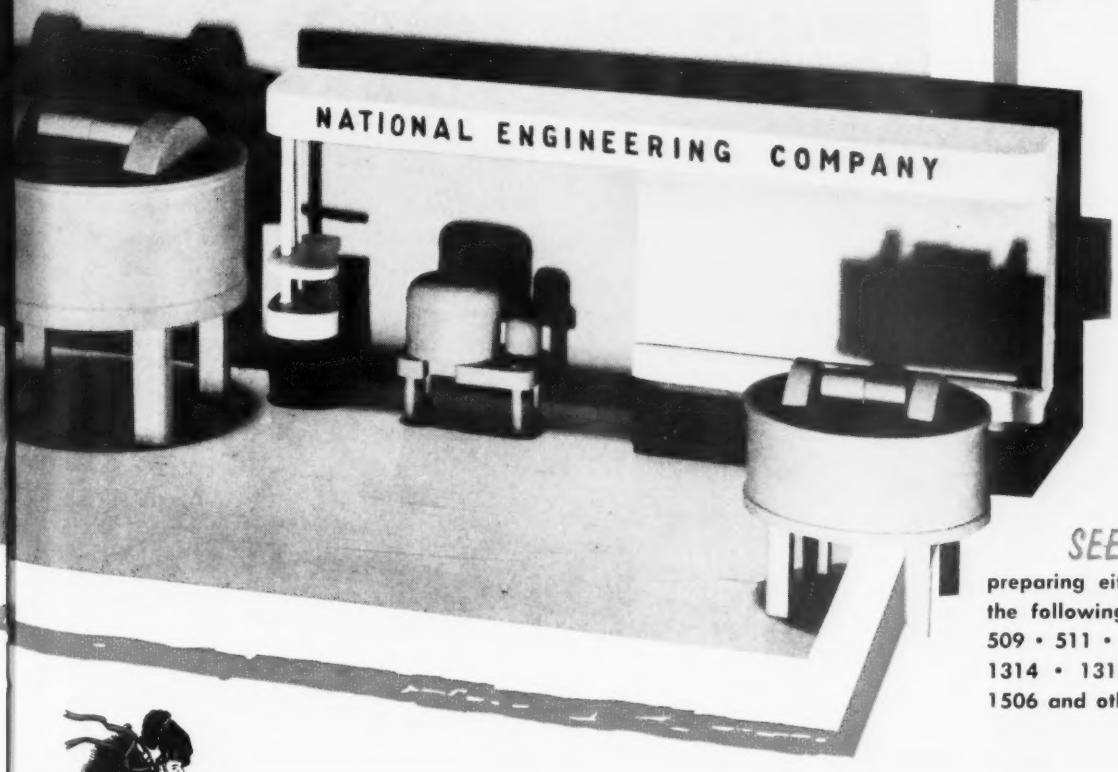
YOU can *feel* it, *see* it as it comes in as waste—watch the entire process from a vantage point; See it, feel its quality before the sand is returned for reuse. And too . . . you can make arrangements to watch it made into cores in an inspection visit.

IN DRAMATIC OPERATING EXHIBIT

NATIONAL Engineering Company Booth at CLEVELAND in MAY

SEE

THE NEWEST F SERIES SIMPSON MIX-MULLERS, now available in a complete range of batch capacities of from 25 to 4000 lbs. See the LF Laboratory Model, the *brand* new 1000 lb. No. 1½ Model F—The proven and popular 4000 lb. No. 3F. See the new No. 1 Model F in operation on 500 lb. batches. Here is your chance to examine modern mulling at first hand; talk to people to whom you have written. We solicit your examination and appraisal—not your buttonhole. Visit NATIONAL while in Cleveland—see for yourself why and how an F Series SIMPSON MIX-MULLER can put *modern* mulling in your plant . . . at an outstanding value per dollar investment!

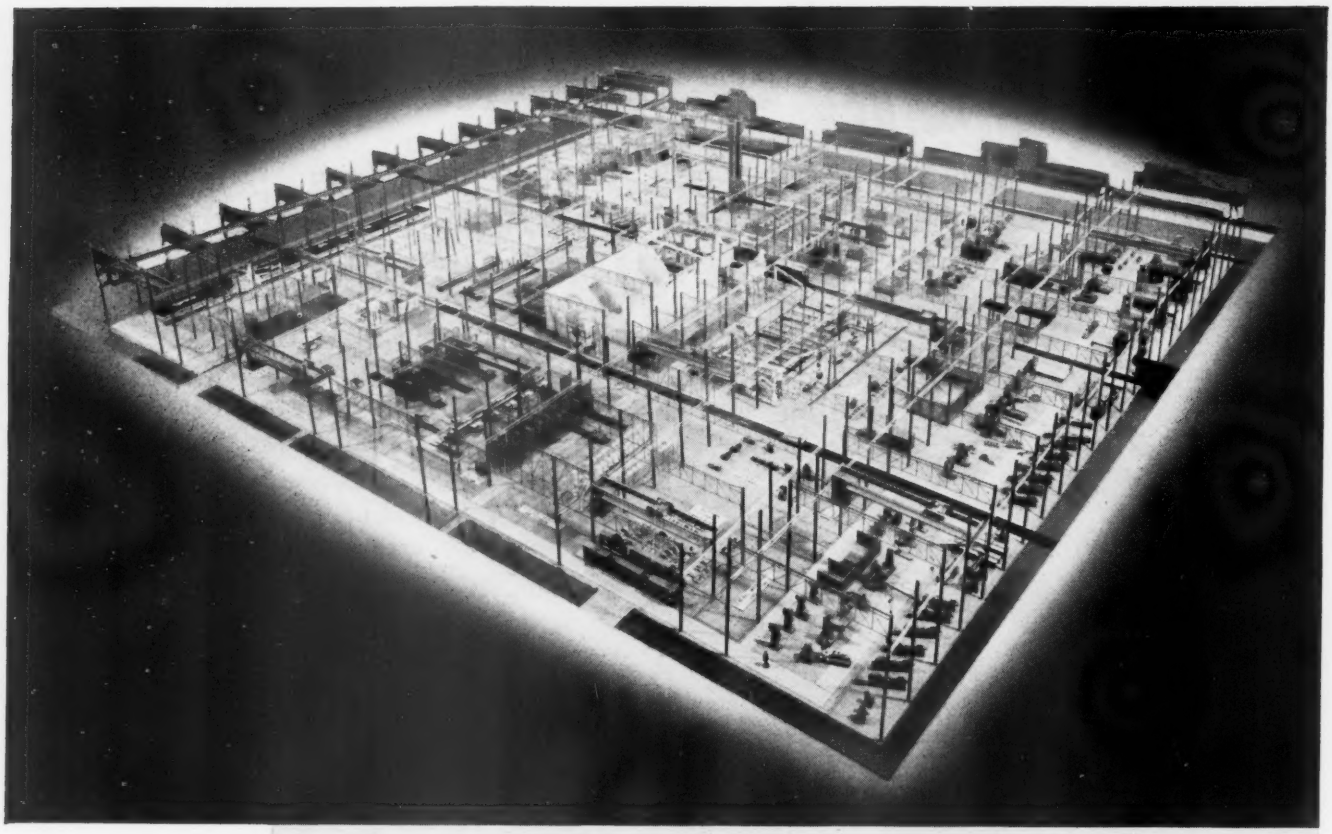


SEE Simpson Mix-Mullers preparing either resin or sand in the following booths:
509 • 511 • 513 • 1310 • 1312 • 1314 • 1316 • 1334 • 1438 • 1506 and others.

National Engineering Company
(Not Inc.)
646 Machinery Hall Bldg. • Chicago 6, Illinois

NATIONAL SAND PREPARING & MOLD HANDLING SYSTEMS

SIMPSON *Intensive* MIX-MULLERS



SWISS FOUNDRY MAINTAINS WORLD COMPETITIVE POSITION BY USING AMERICAN PRODUCTION PRINCIPLES

Knight Services Include:

- Foundry Engineering
- Management Organization
- Industrial Engineering
- Wage Incentives
- Cost Control
- Production Control
- Modernization
- Mechanization
- Materials Handling
- Automation
- Survey of Facilities
- Architectural Engineering
- Construction Management

Pictured above is a 3-dimensional model (by Knight Models, Inc.) of the proposed new foundries, forge, and machine shops for Sulzer Bros., Ltd., Winterthur, Switzerland. Sulzer Bros. is Switzerland's oldest manufacturer of diesel engines, pumps, refrigerators, and general machinery.

Knight Engineers made a study of Sulzer's 5 foundries and developed methods, rigging, and facilities to produce grey iron castings to 30 tons and steel castings to 10 tons—with a reduction in labor and material costs of approximately 35%. Foundry facilities also were developed for piston rings, light automotive castings, nonferrous castings, and precision castings with substantially lower production costs.

Visit our booth No. 1527 at the AFS Convention in Cleveland. See this model and discuss the possibilities of modernizing and mechanizing your foundry operations.

EVIDENCE OF EXPERIENCE

Lester B. Knight & Associates, Inc.

Consulting Engineers

MEMBER OF THE ASSOCIATION OF CONSULTING MANAGEMENT ENGINEERS, INC

600 W. Jackson Blvd., Chicago 6

917 Fifteenth St., N. W., Washington 5, D. C. • Lester B. Knight & Associates, 50 Church St., New York 7

"FOUNDROMATIC" SHAKEOUTS

enough weight to VIBRATE

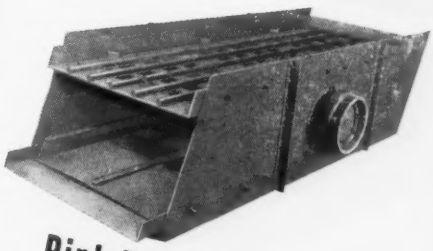
Underview shows why you get years of profitable service from a *Foundromatic* shakeout. The free-floating body includes lateral and longitudinal deck support members and sand hopper in a one-piece welded structure. Stress-relieving the entire unit after welding increases resistance to impact shock load.

The free-floating body of a *Foundromatic* shakeout — illustrated above — weighs more than 40% of shakeout capacity. You needn't worry about low weight ratio retarding shakeout operation with even the biggest castings. You don't have to buy extra capacity to get rapid shakeout.

Low maintenance is the result of its simple, rugged construction. For example, no mechanism shaft has ever broken during operation. Bearings are selected for extra-high service factor. Only one dust seal is needed because of the simple, two-bearing design. A specially designed pivoted motor base assures effective belt tension under all conditions of operation.

"Stopping bounce" has been eliminated too. The new exclusive* automatic snubber control brings the unit to a smooth, quiet stop. Mechanical snubbers — and their replacement — have been completely eliminated. Castings and flasks are not damaged by excessive throw.

*Patented



Ripl-Flo SCREENS

For breaking molding sand lumps — or other foundry screening jobs — you'll find *Ripl-Flo* screens save floor space and reduce maintenance because of their simple, two-bearing design. Write for Bulletin 07B6151.

You can get complete information from your nearby Allis-Chalmers district office. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 07B6365B.

A-4257

Foundromatic and Ripl-Flo are Allis-Chalmers trademarks.

ALLIS-CHALMERS

BE SAFE WITH SiPi QUALITY
BE SAFE WITH SiPi SERVICE
SiPi METALS CORP.
PRIME PRODUCER OF NON-FERROUS ALLOYS
Visit with us at the AFS FOUNDRY SHOW
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COMPLETE WAREHOUSE Stocks in CHICAGO CINCINNATI DETROIT PITTSBURGH for fastest delivery

SiPi METALS CORP. 1720 ELSTON AVE., CHICAGO 22, ILLINOIS

Sales offices in Cincinnati, Detroit, Indianapolis, Milwaukee, Pittsburgh

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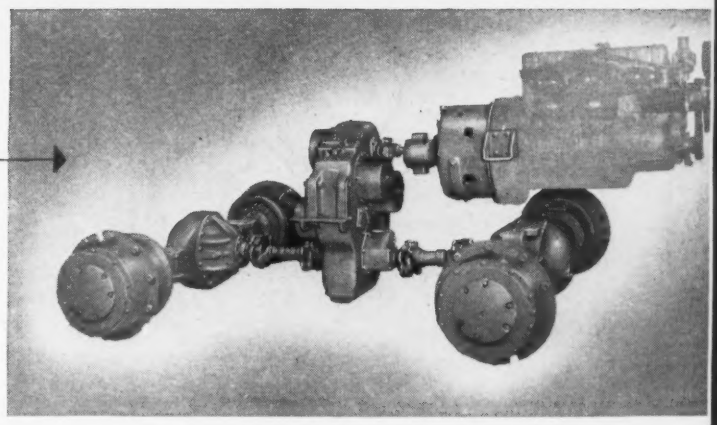
Here's Why The **MICHIGAN** *Tractor Shovel*
WILL DO MORE WORK FOR YOU!

* *This Power Train — from engine to tires — engineered and manufactured by Clark*



* **CLARK TORQUE CONVERTER** — 3-to-1 multiplication factor provides maximum torque *when it is needed.* Precise control in inching and digging.

* **CLARK POWER-SHIFT TRANSMISSION** —no conventional clutch; four speeds forward and reverse—direction control by lever on the steering column.

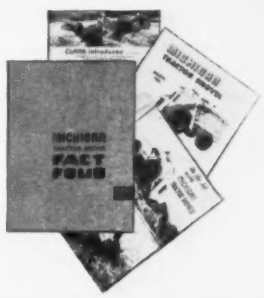
* **CLARK PLANETARY DRIVE AXLE** — final reduction in the wheel reduces the torque load on all gears and shafts.

RESULT — easier operation, utmost accessibility and simplicity of servicing, highest efficiency in shovel handling.

ADD greater weight and more horsepower than any front-end loaders of comparable capacity, and you see why you can Move More with a MICHIGAN*.

*A Trademark of Clark Equipment Company

For full information send for the MICHIGAN Tractor Shovel Fact-Folio — specifications, action photos, magazine article. The coupon will bring your copy.



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CLARK EQUIPMENT COMPANY, Construction Machinery Division
442 Second Street, Benton Harbor, Michigan, U. S. A.

Please send the MICHIGAN Tractor-Shovel Fact-Folio

Name_____ Title_____

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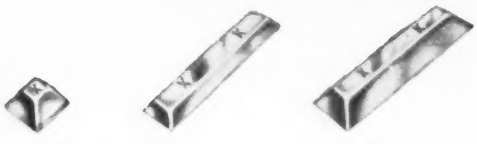
SITUATION UNDER CONTROL — BY KEOKUK

CHIEF KEOKUK:
"Me say to little Chief—Sprinkle salt on bird's tail to catch him. Him SHOOT rock salt"

PRINCESS WENATCHEE:
"Junior has everything under control!"

KEOKUK ELECTRO-METAL COMPANY
KEOKUK, IOWA
WENATCHEE DIVISION, WENATCHEE, WASHINGTON



Keokuk Silvery . . . the *superior* form of silicon introduction for steel plants and foundries . . . available in 60 and 30 lb. pigs and 12½ lb. piglets . . . in regular or alloy analysis. Keokuk also manufactures high silicon metal.

When you're shooting for lower costs and higher quality, consider Keokuk Silvery Pig Iron! *You'll get exact control of the melt—and a uniform silicon distribution.* Car for car, pig for pig, its uniformity *never* varies. Charge Keokuk by magnet or count!

SALES AGENT: MILLER AND COMPANY

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3504 Carew Tower, Cincinnati 2, Ohio
407 N. Eighth St., St. Louis 1, Missouri

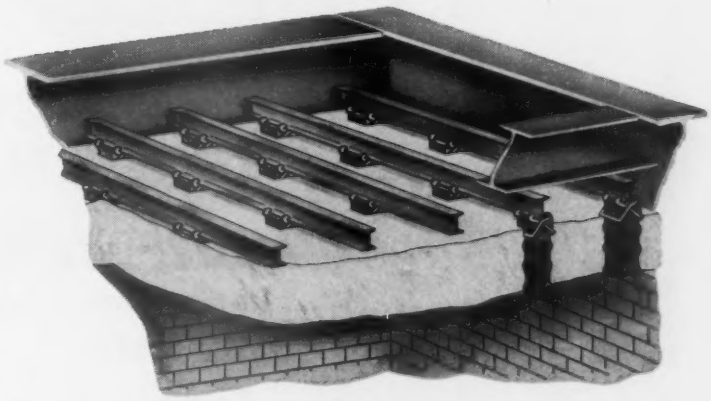
How to get the most out of

Suspended Refractory CONCRETE CONSTRUCTION

An example of B & W's Modern Suspended Castable Construction

Cross section of castable form showing patented anchor tile and "ice-tong" hanger, which can be attached any place on I-beam.

B&W Kaocast may be gunnited, as shown above, or poured into a form.



Cross section of finished B&W Kaocast soaking pit cover, showing anchor tile and "ice-tong" hangers.

The big reason behind today's growing use of suspended castable construction is lower installation cost. The replacement of standard brick and special shapes by refractory castables (just as easy to use as structural concrete) is becoming so widespread that every furnace operator should consider it as a possible means of cutting his own installation costs.

Not only can refractory castables be handled easily, but such troublesome jobs as notching I-beams have been eliminated with B&W's patented anchor tile and "ice-tong" hanger. Maintenance patching is quicker, too, because this hanger can be slipped on or off anywhere on the beam.

But the major reason for the general preference of B&W's suspended castable construction is B&W Kaocast—the only refractory concrete for service up to 3000 degrees. Even at lower temperatures, B&W Kaocast results in longer, more economical service because it has a high resistance to spalling and practically no reheat shrinkage.

The step-by-step story shown at the right is an example of how B&W's modern suspended castable construction is used in soaking pit covers. These covers take plenty of abuse because of the rough handling they get, but B&W Kaocast stays on the job.

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42nd ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.

B&W REFRACTORIES PRODUCTS — B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick Refractory Castables, Plastics and Mortars • OTHER B&W PRODUCTS—Stationary & Marine Boilers and Component Equipment . . . Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers . . . Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings

ALSIMAG®

FOUNDRY CERAMICS

NOT AFFECTED BY MOISTURE

WILL NOT ERODE

ECONOMICAL!

- *Accurate and uniform.*
- *Completely free of gas.*
- *Non-spalling.*
- *Strong, will stand the roughest handling.*
- *Do not contaminate scrap.*

FREE TEST SAMPLES OF STANDARD SIZES ON REQUEST

Samples made to your own specifications at moderate cost.

WRITE FOR BULLETIN 532

AMERICAN LAVA CORPORATION

A SUBSIDIARY OF MINNESOTA MINING AND MANUFACTURING CO.

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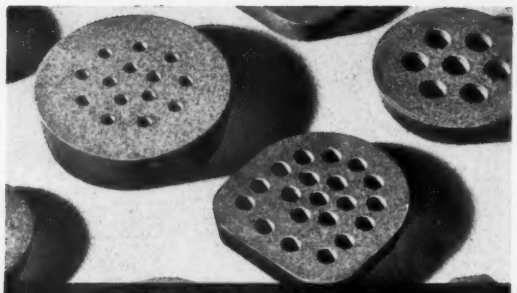
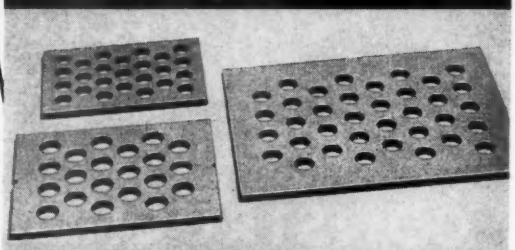
52ND YEAR OF CERAMIC LEADERSHIP



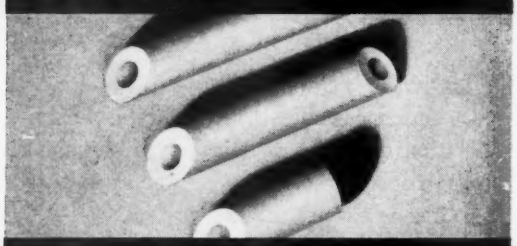
STRAINER CORES

14 standard sizes in stock for immediate shipment. Special AlSiMag cores can be produced at low cost. More economical than shop made sand cores!



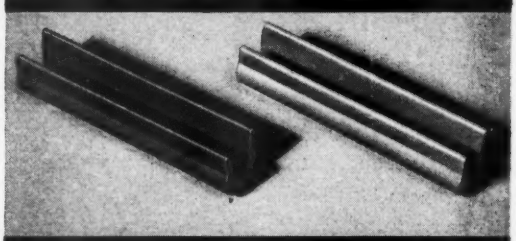
CUT-OFF CORES

Form an easily separated joint between riser and casting. This enables the riser to be broken off after shake out, eliminating cut off time.



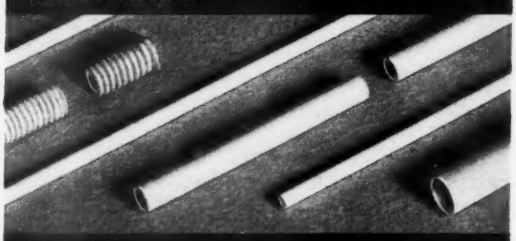
GATE TUBES

Metal flows through a smooth ceramic tunnel gate, assuring slag-free, sand-free castings. Economical to use where better castings are desired.



TROUGHS

For conveying molten metal — often great time-savers. Outline requirements and let us submit recommendations.



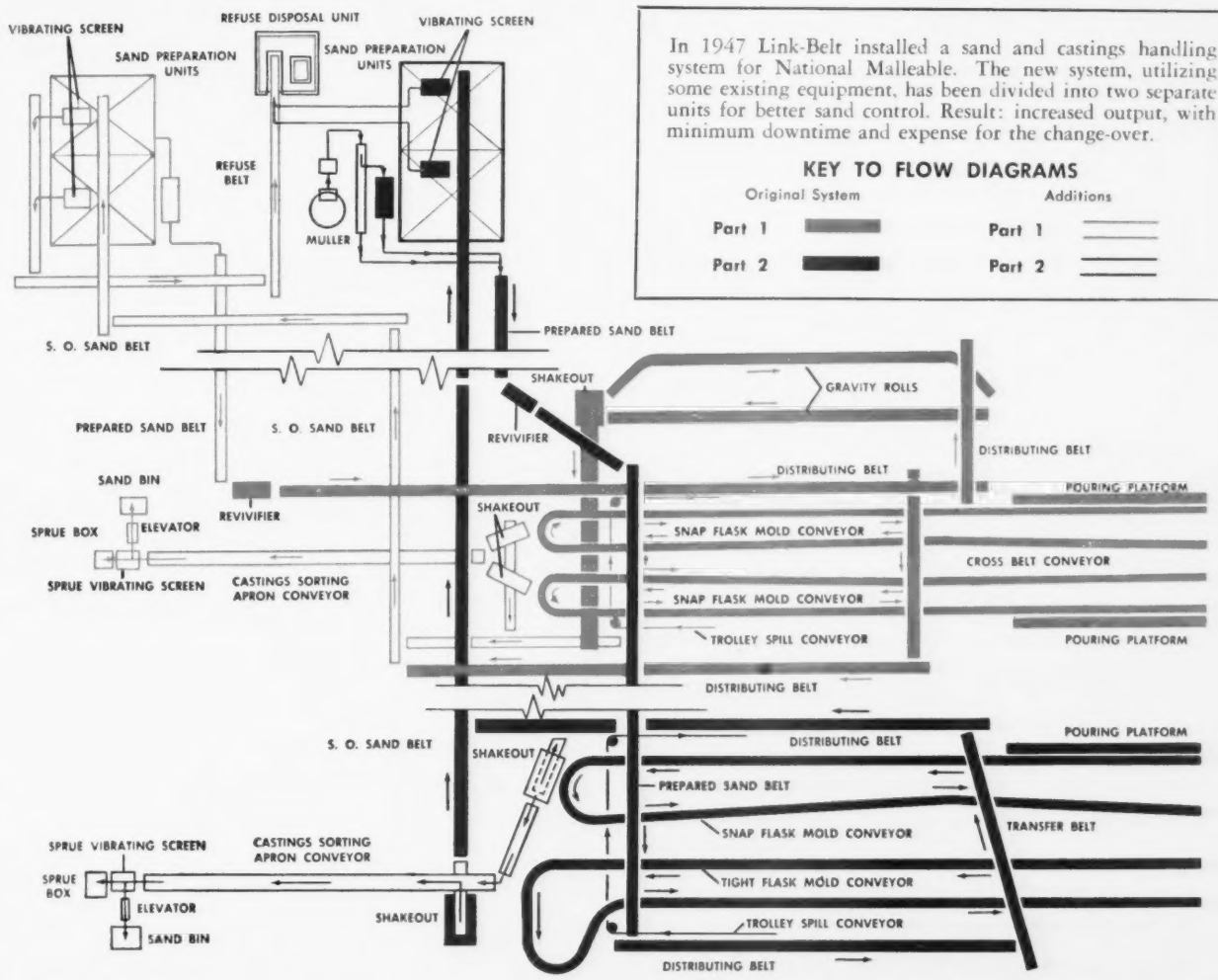
PRECISION CORES

Used mostly in lost wax casting process. Made to close tolerances. An economical and accurate method of forming holes, threads, etc.

SEE OUR EXHIBIT—BOOTH 1422—58th FOUNDRY CONGRESS & SHOW—CLEVELAND, MAY 8-14

When National Malleable & Steel Castings Co. wanted to boost capacity

HERE'S HOW THEY DID IT!



In 1947 Link-Belt installed a sand and castings handling system for National Malleable. The new system, utilizing some existing equipment, has been divided into two separate units for better sand control. Result: increased output, with minimum downtime and expense for the change-over.

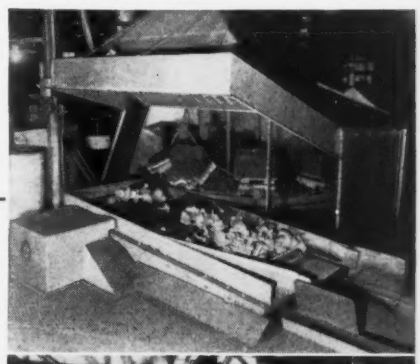
KEY TO FLOW DIAGRAMS

Original System		Additions	
Part 1	▬▬	Part 1	———
Part 2	▬▬	Part 2	———

And AGAIN--this progressive foundry turned to LINK-BELT

WHEN demand outstripped their Indianapolis facilities, National Malleable and Steel Castings Co. turned to Link-Belt to help increase capacity. As shown in the flowsheets above, the job was complex. In collaboration with National Malleable's engineers, Link-Belt foundry equipment designers tackled this assignment.

More and more foundries have learned to rely on the wide, diversified experience of this company. A Link-Belt foundry engineer will be glad to work with you—suggest ways mechanization can bring you increased output, lower costs, improved quality.



Hooded shakeout (top right) receives molds from cam-type dumper. After cooling on apron conveyor (bottom), castings are sprued. In background: Link-Belt overhead trolley conveyor.

LINK-BELT

13,425

CONVEYORS and PREPARATION MACHINERY

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

NOW!...*Another revolutionary development...this time for the rough grinding of* **GRAY IRON** *and* **MALLEABLE IRON**

The new NORTON K BOND†

adds the "TOUCH of GOLD" that raises wheel-life and efficiency to new highs, cuts grinding time and costs to new lows

As Good As They Look! You'll know Norton K Bond CRYSTOLON wheels by their distinctive appearance, as well as by their greatly stepped-up performance. Now available in standard vitrified wheel sizes for floor and bench stands and swing frames, as well as in smaller sizes and cones for portable grinders.

Now, after years of continuous development, the new Norton K Bond is ready to bring you faster, freer cutting action and much longer wheel-life on your slow speed gray and malleable iron rough grinding jobs.

It's the most radically improved vitrified bond ever produced for these applications — and so ideally suited to them that CRYSTOLON* wheels bonded with it are far ahead, from every performance angle, of any wheels you ever used before.

5 big advantages of K Bond CRYSTOLON wheels

1. Faster, freer cutting action
2. Much longer wheel-life
3. Less frequent dressing
4. Hold corners better
5. Consistently duplicated

Already the new K Bond wheels have been thoroughly job-tested, on a wide range of floor stand and bench stand jobs, in foundries throughout the country. And report after report shows that these new wheels are consistently outlasting other wheels, grinding off more metal per dollar and cutting production costs on countless every-day slow speed gray iron and malleable iron grinding jobs.

See the new K Bond at the Foundry Show

The "Touch of Gold" Is Job-Proved. During extensive field testing, the new Norton K Bond CRYSTOLON wheels have made a big hit with operators experienced in rough grinding malleable and gray iron castings. Why not get first-hand reports on these greatly improved wheels? Try them on your own floor stands and bench stands.

PERFORMANCE IS THE PAY-OFF!

Read these reports on tests of K Bond CRYSTOLON wheels made in users' cleaning rooms

From a large eastern piston ring plant:
Ground on the average 11,000 more rings with a K Bond wheel than with any wheel formerly used. Best wheel yet on Lehman piston ring grinders. Re-ordering 100.

From a leading malleable iron foundry:
Lasted 20% longer than previous standard wheels. Very good wheels in every respect.

From a southern gray iron foundry:
K Bond wheels easily the best ever used. Re-ordered in 40-wheel quantities.

From an eastern gray iron foundry:
Increased wheel-life from 80 to 120 hours. Reduced operator fatigue. Several 50-wheel quantity re-orders.

From a middle-western foundry:
K Bond wheels excellent performers. Proved faster cutting. Lasted a week longer than other wheels under same conditions.

At the Foundry Show in Cleveland

the new Norton K Bond wheels, together with many other Norton wheels for rough grinding, will be on exhibition at Booth 1103. We look forward to seeing you there.

See your Norton Distributor

about arranging a test of the new K Bond CRYSTOLON wheels in your plant. Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your phone directory, yellow pages. Behr-Manning Corporation, Troy, N. Y., is a division of Norton Company. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass. W-1562

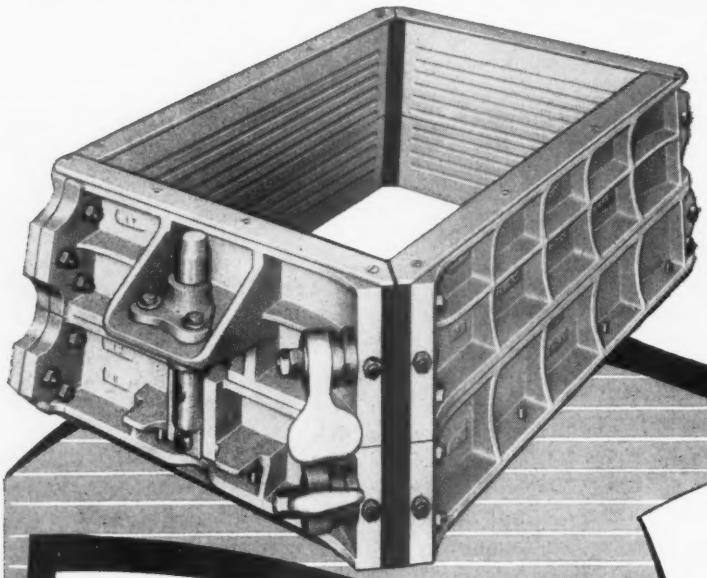
NORTON
ABRASIVES
Making better products... to make other products better

†Patent applied for
*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

Be Sure to See the Popular New

FREMONT SPREADLOCK FLASKS at BOOTH 710

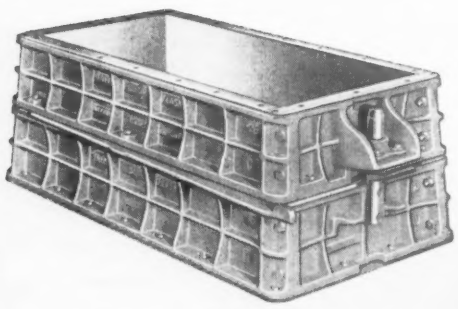
National Annual American Foundrymen's Society Foundry Congress-Cleveland Public Auditorium-May 8-14



No sand can lodge in the open corners of Spreadlock flasks. The corner gaps are completely closed by long-life, easily replaceable, live rubber inserts. Made of magnesium, which has twice the tensile strength of aluminum, they afford much longer service and are easier to handle. Accurately machined inside surfaces and flanges, and steel-faced top and bottom flanges assure more exacting work.

PERFECT ALIGNMENT INDEFINITELY!
Guaranteed by the one-inch GROOVLOCK FOOLPROOF PIN on

FREMONT STANDARD SLIP FLASKS



Particularly adapted to cope or drag pattern jobs. Solid, bolted and welded corner construction. Other types of standard pin fittings available.

SAVE BIG MONEY!
The precision machined and drilled, bolted corner construction of

FREMONT CAST IRON OR CAST ALUMINUM JACKETS

permits easy insertion of new sides or ends. Entire jacket need not be scrapped. The standard style is designed for ordinary foundry practice, the grooved style, which permits ready gas escape, is ideal for steel foundries. Flasks and jackets can be assembled on 3°, 4° or 5° taper.

Write today for free literature and prices. All orders given prompt attention.

THE FREMONT FLASK CO.
Fremont, Ohio

Lakey Foundry saves 112 man-hours per shift in core handling with three 2000-lb. Clarks

Handling finished cores, from baking ovens either to core storage or direct to the molding line used to require 23 men using hand dollies; and stacking was done manually. Now, says Jim Wilson, Methods Engineer, three operators on Clark 2000-lb. trucks with six helpers, do a far better job with a reduction of 112 man-hours per 8-hour shift. "That's nice money!" is Jim Wilson's understatement.

Foundries are a particularly "happy hunting ground" for cost-minded executives armed with Clark fork trucks: on the alert for faster, safer, cheaper ways to handle sand, scrap, cores, molds, castings—all the many handling jobs that make up a foundry's production cycle.

How about some good hunting in your own plant? There's an expert guide available — the Clark dealer: thoroughly competent to analyze your materials handling needs and to devise a plan to satisfy them. He's listed in your directory's Yellow Pages.

(See the Clark booth at the Foundry Show)

HOW LAKEY USES THREE CLARK TRUCKS

Production:	10,000 cores per day from 4 core lines and 4 ovens; grey iron castings chiefly for engine blocks and housings for industrial, agricultural and earth-moving machinery.
Sizes & Wts.:	10"-30" high, cores 12 to 100 lbs. each.
Handling Equipment:	3 Clark 2000-lb. trucks, 36" x 48" plywood and metal pallets, hydraulic load stabilizers with 1" sponge-rubber facing, to hold cores firmly and compensate for varying heights.
Unit Loads:	range from 800 lbs. to 1600 lbs.
Storage:	Palletized units tiered to 15 ft. height; neat rows conserve storage space, simplify removal of cores, promote good-housekeeping.

Industrial Truck Division
CLARK EQUIPMENT COMPANY
Battle Creek 16, Michigan

CLARK EQUIPMENT

Get The Cost-Saving Advantages of TAM* ZIRCONITE* Products

See us at the Foundry Show Booth 1613

You can expect and get cost-saving advantages in foundry and cleaning room operations by using TAM* ZIRCONITE* Products.

With ZIRCONITE*

Sand . . . the problems of burning-in and metal penetration of cores and molds can be entirely eliminated. Easier shake-outs are promoted.

ZIRCONITE*

Flour . . . used as a filler in cores, lowers permeability and increases refractoriness.

ZIRCONITE*

Paste Wash . . . will not fuse with molten metal. It resists metal wetting, prevents metal penetration and produces smooth casting surfaces. It has "universal" application in all types of foundries.

You can get complete facts at the Show or by writing our New York City office.

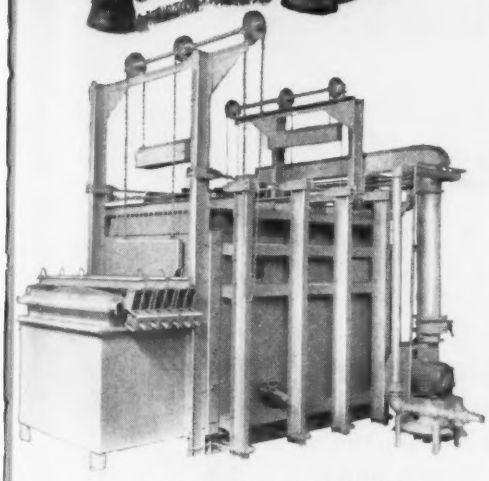
TAM PRODUCTS
Registered U. S. Pat. Off

TITANIUM ALLOY MFG. DIVISION
NATIONAL LEAD COMPANY
Executive and Sales Offices: 111 BROADWAY, NEW YORK CITY
General Offices, Works and Research Laboratories: Niagara Falls, N. Y.

* Registered Trademarks

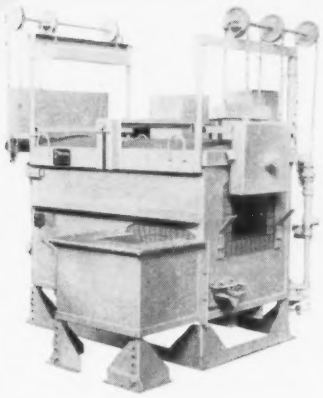
WORKHORSES for ALUMINUM

Here are the furnaces that bear the brunt of the burden in the aluminum foundry industry. They are designed for production of unsurpassed quality metal, in the fastest, most efficient and economical manner. Each has its specific purpose and capacity, meeting the exacting demands of sand foundries, die casters, permanent mold plants and smelters. They are recognized as the finest in the industry, reduce costs and make working conditions most agreeable. All furnaces may be fired by either gas or oil.



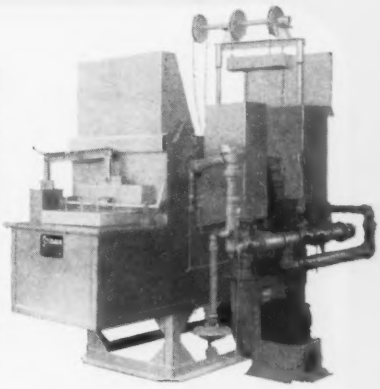
SMELTERS FURNACE

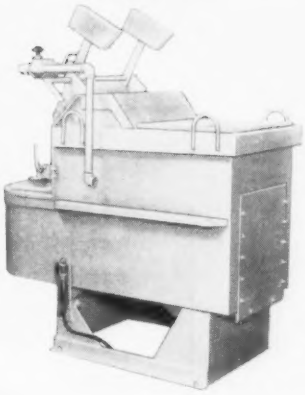
Built especially for smelters and other large melters. Easy charging, drossing, fluxing and alloying. Can be built to your own specifications. Capacities from 3000 lbs. Aluminum up.



MODEL "DC" FURNACE

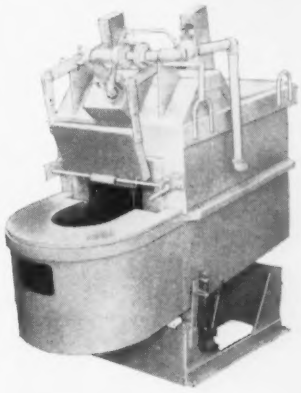
The 2 in 1 furnace. Breakdown and Holding in the same unit. Cold metal never reaches the molten bath. Assures metal of the finest quality on all classes of work. Close temperature control. Can be used as a sweat furnace for reclaiming inserts. Ideal for all types of plants including sand, permanent mold and die casting. Capacities from 350 lbs. Aluminum up.

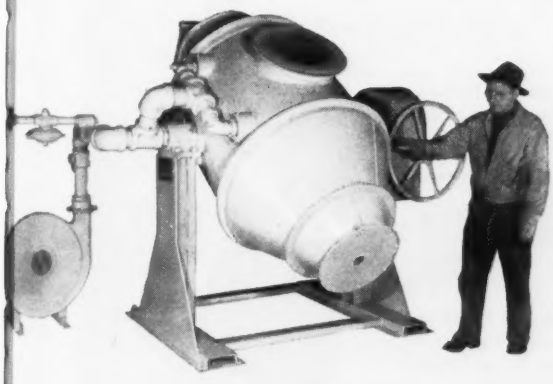




MODEL "DSC" DIE CASTING FURNACE

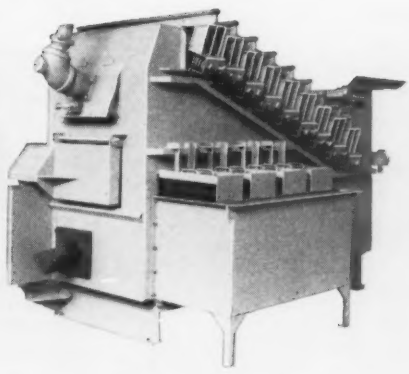
A small reverberatory furnace for melting and holding, or for holding only when hot charged at the die casting machine. Made in various sizes to meet your requirements.





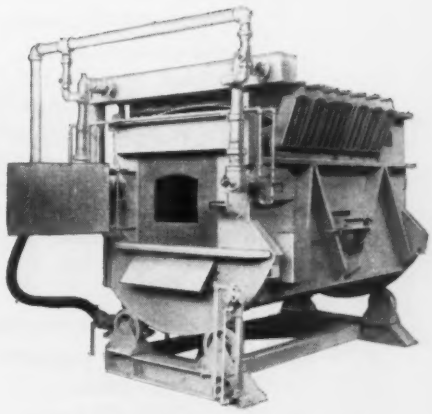
MODEL "BFC"

Hand tilt, open flame, barrel type furnace with flames firing tangent to inside of lining. Very fast melting. Used in all type plants including smelters. Capacities—500 lbs. Aluminum. A must for all aluminum jobbing sand foundries.



MODEL "MC" DIP-OUT TYPE

For melting and holding all in the same furnace. Hot metal always available. No iron pots or crucibles to replace. Capacities from 500 to 5000 pounds of aluminum.



MODEL "SW"—TILTING TYPE

Excellent to run back returns along with ingot required for permanent mold, die or sand casting operations. Also an ideal breakdown furnace. Capacities—600-1000-1700-3000 lbs. Aluminum.

STROMAN FURNACE & ENGINEERING CO.

DIVISION OF

THE PETERSEN OVEN CO. • 9900 FRANKLIN AVE. • FRANKLIN PARK, ILL.

1854 *100 Years* 1954

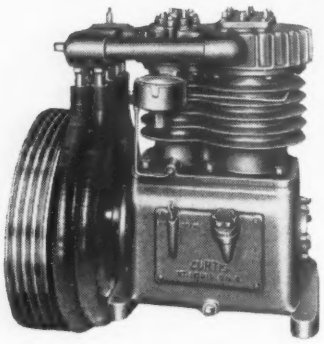
OF SUCCESSFUL MANUFACTURING EXPERIENCE

GET MORE PRODUCTION...PER MAN-HOUR

with the help of dependable, efficient

Curtis

AIR COMPRESSORS • AIR CYLINDERS • AIR HOISTS



MORE AIR AT LESS COST...
with powerful, precision-built *Curtis* compressors

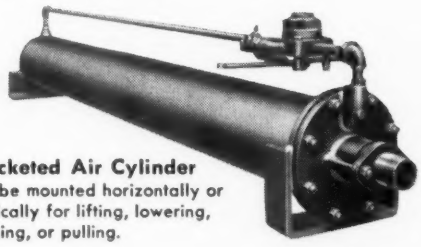
- available up to 50 H.P.
- improved — two-stage design delivers more air per horsepower
- air-cooled — no freeze up — low-cost installation and operation
- Timken tapered main bearings permit external adjustment
- pressure lubricated rod and piston bearings for long life

Tank mounted compressors
¼ through 15 horsepower
Simple compressors
¼ through 50 horsepower

TO LIFT, LOWER, PUSH, OR PULL ***Curtis*** **Air Cylinders or Air Hoists Will Do The Job Quickly, Easily, and Economically — capacities up to 10 tons.**

- low-cost trouble-free operation
- smooth and delicate control
- cylinders, ground and polished
- disc-type valves lapped to seat

Pendant Air Hoist...
ideal for any lifting or lowering application.



Bracketed Air Cylinder
can be mounted horizontally or vertically for lifting, lowering, pushing, or pulling.

FOR COMPLETE INFORMATION on how Curtis equipment can make your production more profitable, write today...

CURTIS PNEUMATIC MACHINERY DIVISION
of Curtis Manufacturing Company
1922 Kienlen Avenue, St. Louis 20, Missouri

755

WHEN IT COMES TO LININGS . . .

Quality counts!

THERE'S ONLY ONE HELSPOT

LADLES — Lining is easy. HELSPOT comes in convenient slices, ready to tamp into place. Forms skimmer spouts, too.

CARRIERS — The ease of installing, and long life, of HELSPOT . . . plus easy slag removal, makes HELSPOT a profit-builder.

SPOUTS — The "lubricating" quality of HELSPOT causes metal to flow freely; slag formations that may cause bridging are held to a minimum. Metal stays cleaner.

- √ Cleaner, more perfect castings when linings are made with HELSPOT!
- √ Graphite in HELSPOT produces a lubricating characteristic; helps fight slag.
- √ HELSPOT is composed of Super-duty clays possessing high refractoriness.
- √ HELSPOT saves time in cleaning ladles; fewer repairs to linings required.

HELSPOT is an exclusive MEX-R-CO product designed for lining ladles, spouts, runners and metallurgical furnaces in grey iron, malleable iron and steel foundries and nonferrous shops wherein the refractory comes in contact with molten metal or slag.

HELSPOT is packed in 100-lb. waterproof cartons, already sliced for ease of handling. For those who prefer a dry material, HELSPOT DRY is available in 100-lb. bags.

MEXICO
REFRACTORIES COMPANY
MEXICO, MISSOURI — U.S.A.
Affiliate: National Refractories Co., Philadelphia, Pa.

MAIL THIS COUPON FOR COMPLETE INFORMATION

MEXICO REFRACTORIES COMPANY • MEXICO, MO.

Gentlemen: Please send me complete information on HELSPOT.

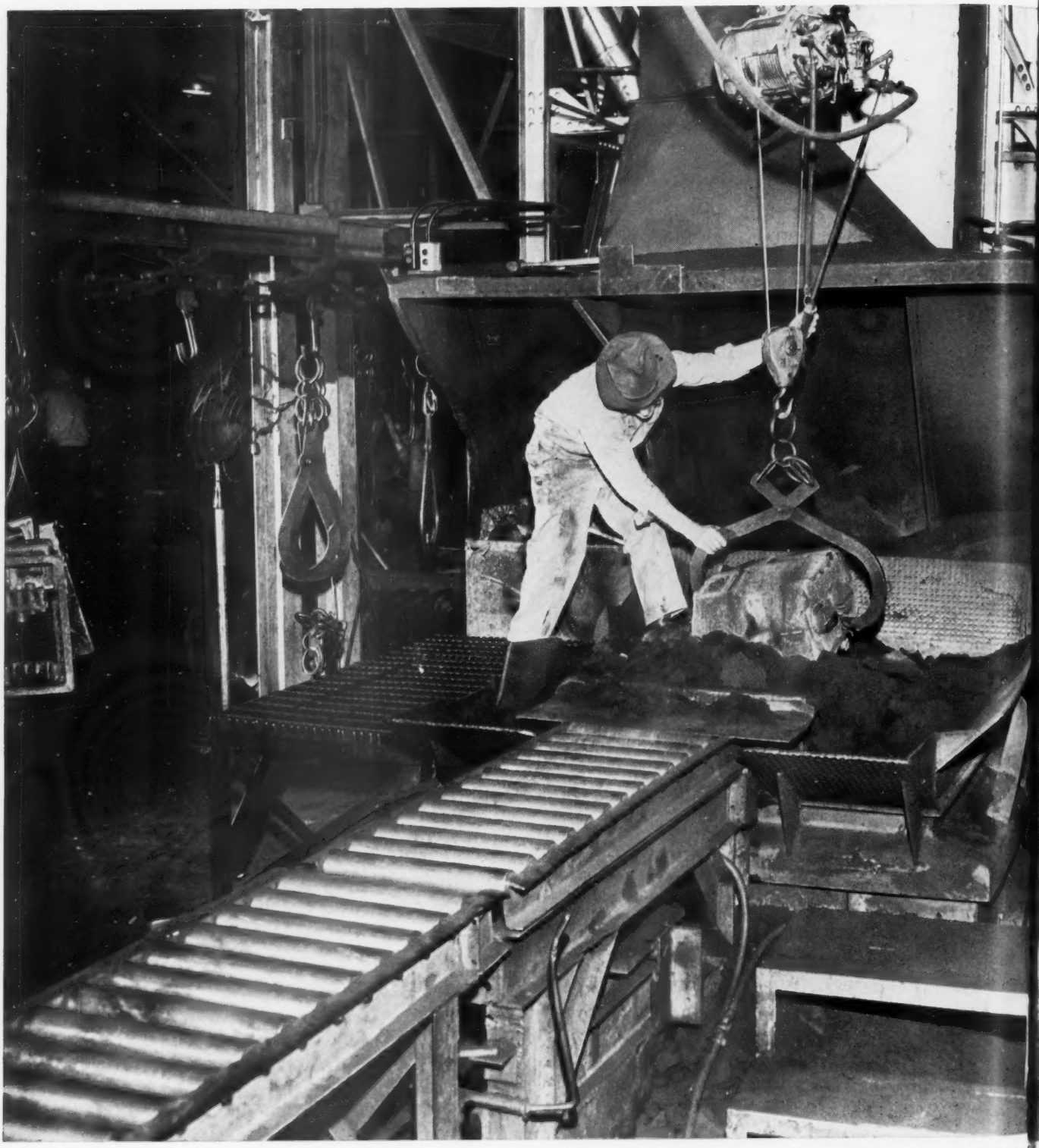
NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

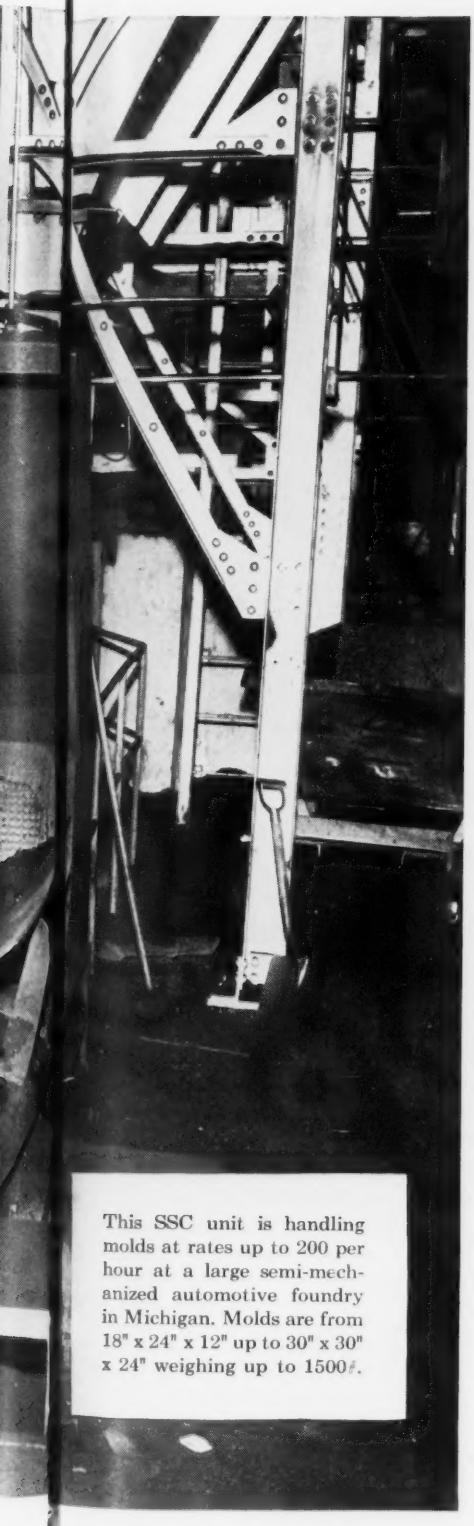
See How This SSC Unit Can



HEWITT-ROBINS

EXECUTIVE OFFICES, STAMFORD, CONNECTICUT

Cut Your Production Costs



This SSC unit is handling molds at rates up to 200 per hour at a large semi-mechanized automotive foundry in Michigan. Molds are from 18" x 24" x 12" up to 30" x 30" x 24" weighing up to 1500#.

Don't miss the Hewitt-Robins SSC (Shakeout-Screen-Conveyor) Unit in action at the Foundry Show this May — Booth 1123

The SSC unit is the 5 in 1 foundry unit specially designed for large or small production or jobbing foundries. Operated as a stationary or fully portable unit, the SSC unit handles complete shakeout and sand reclamation . . .

FLASK SHAKEOUT—castings quickly released on the deck, remaining with gagger, risers and other sand supporters for easy removal.

SAND SCREENING—sand passes immediately onto screening deck equipped with non-bind cloth and through to conveyor. Primary separation of large trampmetal and core butts handled at this stage.

LUMP BREAKING—lumps pass under self-activating lump breaker, are crushed to screening size while all core butts are automatically discharged through a chute.

CONVEYOR FEEDING—sand falls on belt conveyor equipped with a Hewitt-Robins Maltese Cross Fiberglas Belt for delivery directly to sand conditioner.

TRAMP-METAL TRAPPING — conveyor has permanently magnetized head pulley to tap all metal particles small enough to pass through shakeout deck and screening surface.

The Hewitt-Robins SSC unit with its lower power requirements and lower cost mechanization will help solve your foundry problems . . . it's engineered for savings!

ENGINEERING DATA

SHAKEOUT: 5'x6'deck area, perforated plate & skid rails, 4 ton capacity . . . sand capacity 50 TPH . . . mold shakeout-time averages 3 seconds.

SCREEN: Sizing down to ¼" material at capacities of 75 TPH . . . lump breaker capacity 5 TPH of sand lumps.

CONVEYOR: Belt—Fiberglas (sand up to 400° F.) . . . width—20" . . . capacity 100 TPH . . . magnetic head pulley.

Here is a partial list of

HEWITT-ROBINS PRODUCTS

that will help you cut handling costs and increase operating efficiency.

MACHINERY

Belt Conveyors
Belt & Bucket Elevators
Car Shakeouts
Conveyor Idlers
Dewaterizers
Mechanical Feeders
Foundry Shakeouts
Mine Conveyors
Reclaiming Systems
Screen Cloth
Stackers & Trippers
Vibrating Conveyors & Screens

INDUSTRIAL RUBBER PRODUCTS

BELTING:

Conveyor
Elevator
Transmission

HOSE:

Acid
Air & Air Drill
Barge Loading
Dust Suction
Fire
Fuel Oil & Gasoline
Gasoline Pump
Mud Pump Suction
Oil Suction & Discharge
Propane-Butane
Road Builders'
Rotary Drilling
Sand Blast
Sand Suction
Sea Loading
Servall®, All-Service
Steam
Tank Car & Tank Truck
Vacuum & Air Brake
Water & Water Suction
Welding, Twin-Weld®

•

For information and service on industrial rubber products, contact your Hewitt-Robins Industrial Supply Distributor. Through his complete stock of Hewitt-Robins Rubber Products, and his familiarity with local field conditions, he can fill your supply needs promptly and correctly. See Classified Phone Book for the Hewitt-Robins Industrial Supply Distributor serving your area.

3619

INCORPORATED

DOMESTIC DIVISIONS: Hewitt Rubber • Robins Conveyors • Robins Engineers • Restfoam
FOREIGN SUBSIDIARIES: Hewitt-Robins (Canada) Ltd., Montreal • Hewitt-Robins Internationale, Paris, France • Robins Conveyors (S. A.) Ltd., Johannesburg • **EXPORT DEPARTMENT:** New York City.

FOUNDROMATIC *Dielectric* SAND CORE DRYER

NOW—

these cores dry in 1⅓ minutes ...INSTEAD OF 60!

This is typical of the time savings you can make with a *Foundromatic* core dryer! This unit dries cores in only a small fraction of the time required in conventional ovens . . . literally cuts drying time from hours to minutes.

The method is not only amazingly fast, but core quality is actually improved. Cores have a smooth finish and superior shakeout characteristics.

Using a *Foundromatic* dryer, it is no longer necessary to make cores ahead of time and build up a stock. Cores are not only dried fast, but come out of the dryer cool enough to handle bare handed, and ready to use.

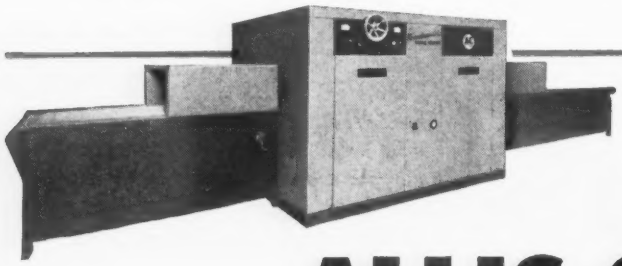
60% SAVING IN HEAT COSTS

There's no waste heat! All heat goes into core. If there are no cores between electrodes, no energy is wasted. Result: low costs . . . no heat, smoke, fumes in core room.

Find out more about this modern core drying. Call your nearby Allis-Chalmers district office, or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-4346

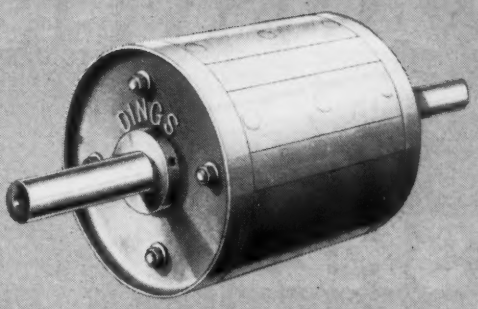
Foundromatic is an Allis-Chalmers trademark.

See our exhibit at the Foundry Congress and Show, Cleveland, May 8-14.



Get This Bulletin!
It is full of facts on dielectric sand core drying. Ask for 15B7306B.

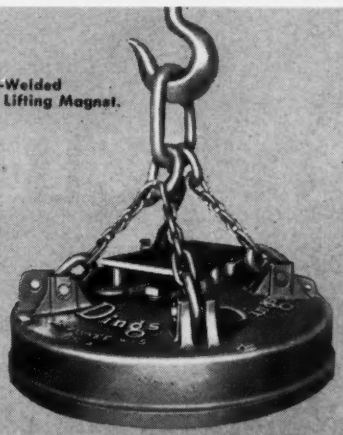
ALLIS-CHALMERS



Dings Non-electric, Permanent Perma-Pulley.

Dings Extra Powerful Self Cleaning Rectangular.

1. 2. 3. 4.



Dings All-Welded Cooler Operating Lifting Magnet.

Dings "Holdtite" holds castings in position for swing grinding.

4 WAYS TO CUT HANDLING COSTS

Compare the advantages these Dings magnets offer over your present methods:

1. THE NON-ELECTRIC, PERMANENT PERMA-PULLEY in the sand handling system takes iron out automatically, without attention, without electricity, without maintenance. Perma-Pulleys have no operating expense, are guaranteed to be permanently magnetic. Magnetic strength is certified.

2. THE SELF CLEANING RECTANGULAR FOR THE TOUGHEST JOBS . . . *another sand handling cost-cutter.* Great power enables this magnet to handle particularly difficult iron extraction jobs. For *maximum* iron removal, none can surpass the Dings Rectangular. Self-cleaning feature makes operation automatic—eliminates "carry-over" of sand with iron.

3. LIFTING MAGNET LIFTS 10 TO 100% MORE. Ideal for handling scrap, pig iron, castings, metal flasks, etc. Lifts more because it's cooler operating. All welded, lightweight, moisture-proof, rugged, 4-point chain suspension.

4. "HOLD-TITE" CUTS GRINDING LABOR COSTS UP TO 25%. Firmly holds all shapes of castings up to 1000 lbs. in position for swing grinding. Magnet can be tilted to 7 different positions. Requires practically no maintenance, simple to install. SEND FOR THIS PAPER: *"Lowering Cleaning Room Costs Through Use of Magnetic Chucks".* Use coupon below.

If you can use the advantages these magnets offer, NOW is the time to act. Deliveries are still better than average.

Dings

DINGS MAGNETIC SEPARATOR CO.
4708 W. Electric Ave., Milwaukee 46, Wisconsin

SEND THIS COUPON
OR DROP A POSTCARD

Dings: Send me Catalog containing full information on

☐ PERMA-PULLEY ☐ LIFTING MAGNET
☐ RECTANGULAR ☐ "HOLD-TITE" plus

Article on "Lowering cleaning room costs through the use of magnetic chucks"

NAME.....

COMPANY.....

ADDRESS.....

.....

.....

See the Dings Exhibit at the Foundry Show—Booth 216

HERE'S YOUR ANSWER

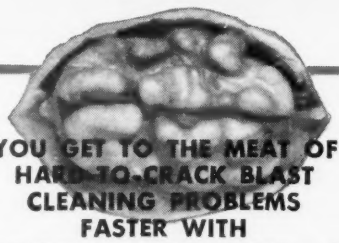
to faster, better, uniform,
low-cost blast cleaning

IN A NUTSHELL

That's a broad claim. We don't expect you to accept it without substantiation. We hope you will ask us to present our proof. All we ask, is that you let it be on-*your*-job proof. Proof we know you'll believe! The only proof we want you to accept.

Like many production finishing men, perhaps you have always taken shot and grit pretty much for granted. If so, you have a surprise coming, for Hi-Grade Shot and Grit IS different—so superior, in so many ways—you can only appreciate its true value by job-testing the material yourself. That way you get proof of performance you can accept as conclusive. Order a trial quantity today. We'll let results speak for themselves. You'll find they say, "*Hi-Grade is best by test*"—your answer to faster, better, uniform, low-cost blast cleaning, in a nutshell.

Packed in 100 lb. Bags—Ready For Immediate Shipment



YOU GET TO THE MEAT OF HARD-TO-CRACK BLAST CLEANING PROBLEMS FASTER WITH

HI-GRADE SHOT AND GRIT

- **YOU GET MORE EFFICIENT PEENING AND CLEANING.** Hi-Grade Shot and Grit is uniform, especially processed to withstand repeated strain, stress and wear.
- **YOU GET MORE FOR YOUR BLAST CLEANING DOLLAR—LESS WASTE.** Hi-Grade Shot is famous for its lack of hollows, tails and irregular shapes which do no good, yet cost money. Hi-Grade Grit is free from dust fines and scale. This alone, saves you up to 20% in actual cost *before you even use Hi-Grade Shot and Grit.*
- **YOU GET A LOWERED COST PER TON OF CASTINGS CLEANED** because Hi-Grade Shot and Grit has a longer re-use value. Special alloying and tempering process minimizes impact fractures.

HI-GRADE SHOT AND GRIT MORE THAN MEETS S.A.E. SPECIFICATIONS—SCREENED AND GRADED FOR 100% USAGE

Clayton-Sherman *Abrasives Company*

MANUFACTURERS OF *QUALITY-CONTROLLED* SHOT AND GRIT

Representatives in Principal Cities

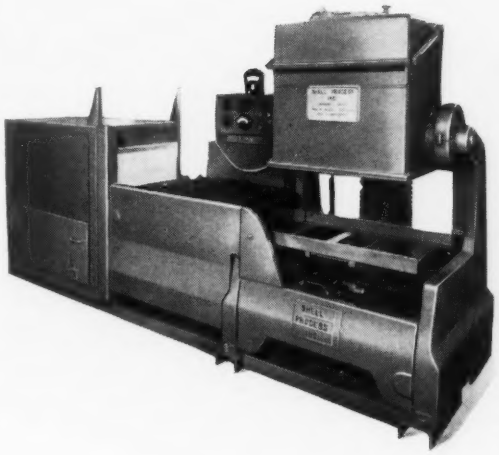
3896 LONYO ROAD ★ DETROIT 10, MICHIGAN

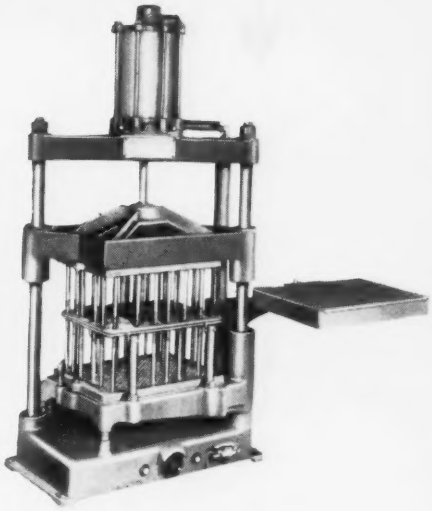
SHELL MOLDING MACHINE — UNSKILLED WORKER — SHELL BONDER

1-2-3

HERE'S YOUR TEAM!*

FOR RAPID SHELL PRODUCTION





This is the most effective team you can have for the rapid production of shell molds. One minute from Shell Molding Machine to perfectly bonded shell ready for horizontal, vertical or diagonal pouring with little or no back-up problems.

*SEE YOUR TEAM IN ACTION!

BOOTHS 1518 1621 FOUNDRY SHOW
CLEVELAND — MAY 8-15, 1954

SHELL PROCESS, INC.

Manufacturers of Shell Molding Machines and Allied Equipment

345 McKINSTRY AVENUE • CHICOPEE, MASSACHUSETTS

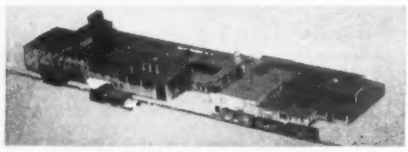
PNEUMATIC CONVEYORS FOR FOUNDRY SAND

WHIRL·AIR·FLOW

- Foundry sand exactly where you want it . . . as convenient as water from a faucet.
- Instant push-button control of entire system, by one man, from operating panel at sand muller location.
- Pipeline installation requires minimum space, permits expansion or changes in system, is adaptable to efficient plant layout.
- Achieves a new low in operating and maintenance costs.

"OUR PNEUMATIC SAND CONVEYOR HELPS US MEET THE GROWING DEMAND FOR **DUCTILE IRON CASTINGS**"

Says Mr. Harold Halverson, pres
BELOIT FOUNDRY CO.
BELOIT, WISCONSIN



The Beloit Foundry Company is a pioneer in the production of ductile iron castings. Their Whirl-Air-Flow pneumatic sand conveyor is doing an excellent job of distributing molding and facing sand to stations throughout the foundry.

Look for us at the A.F.S. Show! —we'll be in BOOTH 1533

WHIRL-AIR-FLOW Division
GERWIN INDUSTRIES, Inc.
MICHIGAN CITY, INDIANA

READERS' COMMENT

Cost of Alloy Gray Iron

TO THE EDITORS:

I wish to thank you for giving the Gray Iron Founders' Society publicity on the "Cost of Special Alloys." C. R. Culling did a real job on this section of the Cost Manual No. 2. We realize that it is hard to spell out the procedure because so much depends upon local conditions. However, if foundrymen will study this report, they will begin to realize that it is a problem and should be handled by the best man in the cost department.

You did a good job in reproducing the article.

A. E. HAGEBOECK
Executive Vice President
Frank Foundries Corp.
2020 *Third Ave.*
Moline, Ill.

•

TO THE EDITORS:

We were all very happy to see that you published our article "Cost of Special Alloys" in the March issue of FOUNDRY. This, of course, forms a section in our Cost Manual No. 2 which will be released by the Gray Iron Founders' Society shortly; therefore, in my opinion you have rendered a real service to the industry in publishing the article at this time.

C. R. CULLING
President
Carondelet Foundry Co.
St. Louis 10

•

TO THE EDITORS:

I think you have rendered the gray iron foundry industry a valuable service by publishing the article on "Cost of Special Alloys" in your March issue.

When the Gray Iron Founders' Society Cost Committee tackled the job of preparing standard procedure for figuring the cost of special alloys, we made an investigation of the practices of a number of foundries and found that many of the foundries producing alloy castings do not fully understand the various losses that occur in the melting process, in the ladle, and in handling. Also, many figure on a theoretical recovery of alloy content from gates, sprues, etc., which is not actually realized in practice.

There was also considerable confusion about terminology. We therefore felt that the subject was important enough to go into very thoroughly and the Cost Committee, spent a great deal of time in working out the best procedure and the best way to present it so that it could be clearly understood by the average foundryman.

We believe that the procedure outlined represents the best practice used by those who have had long experience in the production of alloy castings, but we would most sincerely welcome any comments or suggestions that any of your readers might wish to make and would be only too glad to give open-minded consideration to any suggestions which might improve either the procedure or the way in which it is presented.

JOHN L. CARTER
Cost Consultant
Gray Iron Founders' Society
20 *Church St.*
Montclair, N. J.

* * *

Huntington Wheel Dressers

TO THE EDITORS:

We have noted in your March issue in the Trade Name Directory, on page 173 that you list "Huntington." For your information, "Huntington" is generally used in the industrial suppliers and foundry suppliers market to indicate star toothed type dresser cutters, and these are made by six or seven different firms throughout the country under that name.

On page 288 of the March issue you will note our advertisement referring to "Huntington" as a type of cutter or dresser using star toothed cutters.

R. S. MCCONNELL
Desmond-Stephan Mfg. Co.
Urbana, O.

* * *

"Let's Kick It Around"

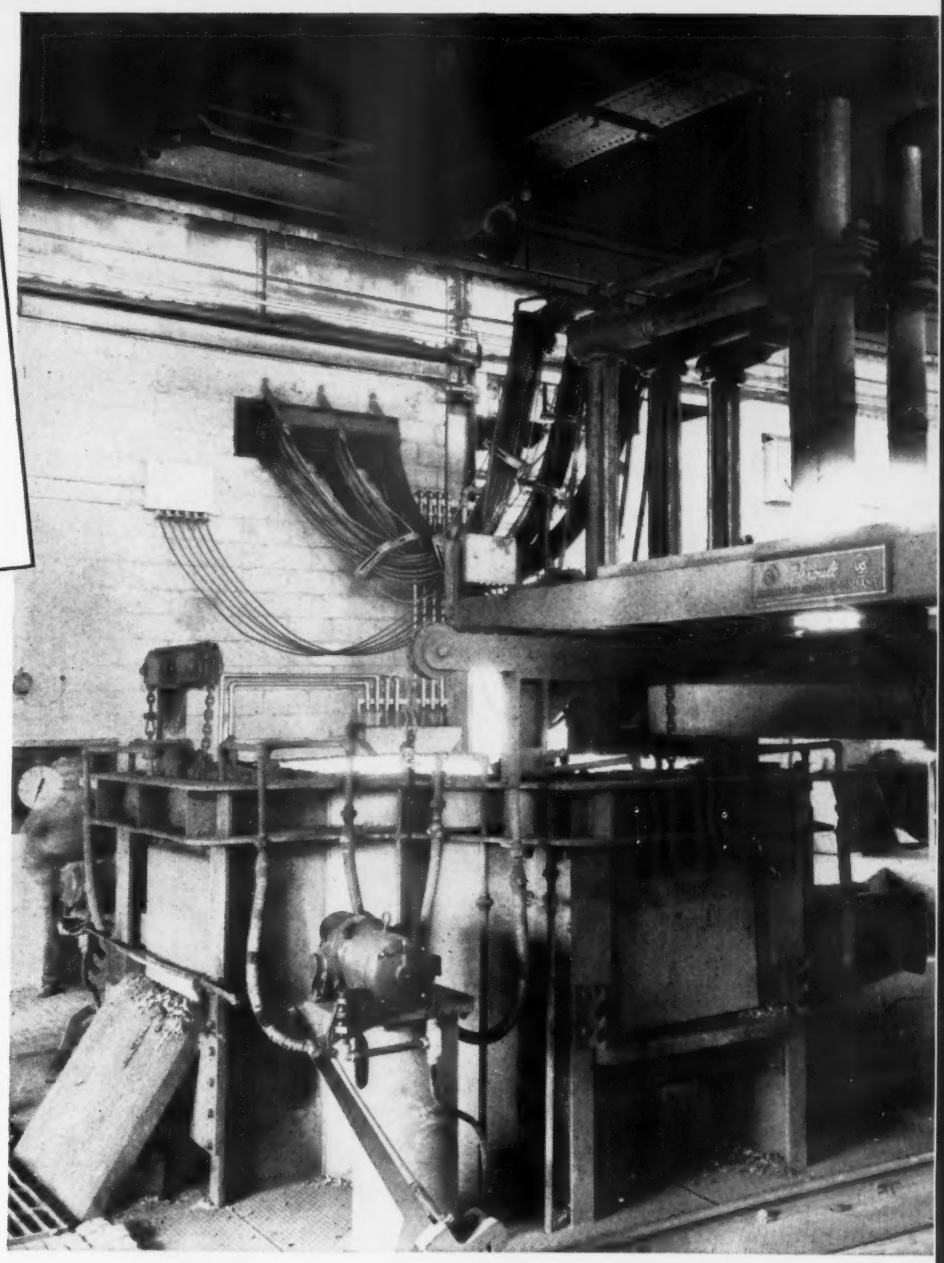
TO THE EDITORS:

"Let's Kick It Around" by Tom Barlow is a refreshing piece of advertising. In the first place it sounds like Tom, being humorously written. But, most important, it is more than a bunch of words; it is a story with continuity of thought. Most ads give me several blows to the brain with select and often catchy phrases or figures which don't sink in; only to be dislodged by the same treatment from the next ad.

Tom is more subtle than that. He gets you interested in his story; then he makes you ask him the questions he wants to answer. Of course, I

(*Continued on page* 104)

Heroult
ELECTRIC MELTING FURNACES



The high production capacity of the Heroult makes it the foundryman's favorite furnace!

NEW CATALOGUE
Now Ready

Contains up-to-date information on Heroult Electric Melting Furnaces – types, sizes, capacities, ratings, etc. For free copy, write to our Pittsburgh office.

AVAILABLE in foundry sizes with either Gantry or swing-type roof, these widely used furnaces are equipped with the latest time- and labor-saving mechanical devices and electrical controls. They are noted for their efficient performance, low operating and maintenance costs.

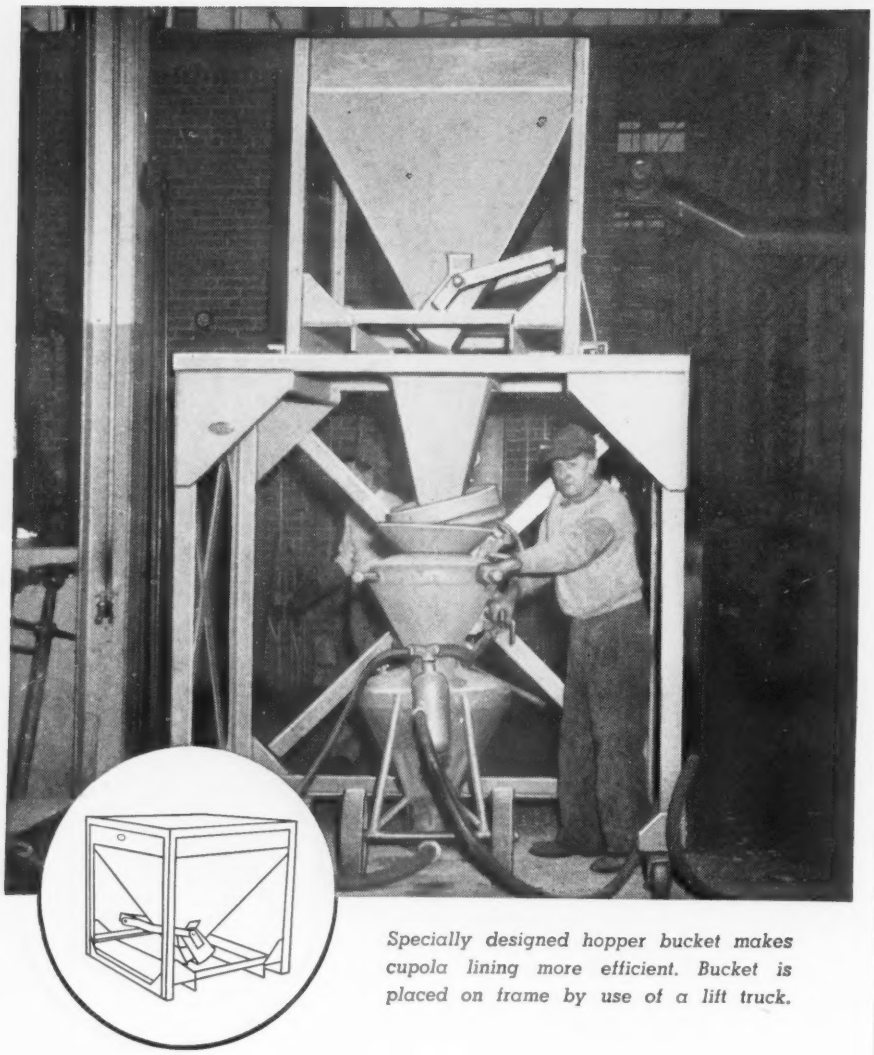
We welcome an opportunity to help you select and install the foundry furnace best suited to your requirements.

AMERICAN BRIDGE DIVISION, UNITED STATES STEEL CORPORATION
GENERAL OFFICES: 525 WILLIAM PENN PLACE, PITTSBURGH, PA.

Contracting Offices in New York, Philadelphia, Chicago, San Francisco and other principal cities.
United States Steel Export Company, New York

USS

UNITED STATES STEEL



Specially designed hopper bucket makes cupola lining more efficient. Bucket is placed on frame by use of a lift truck.

Solve Your Material Handling Problems With PENN IRON SPECIAL EQUIPMENT

In lining cupolas, Textile Machine Works foundry in Reading, Pennsylvania, had difficulty handling the clay mix used with their Bondactor equipment. After a study of the problem, Penn Iron Works, Inc., designed, engineered and manufactured this special hopper bucket for maximum handling efficiency.

Whatever the bulk-material handling problem in your plant, Penn Iron Works, Inc., will be glad to help with its solution. Our wide experience in designing and manufacturing all types of buckets and special handling equipment for foundries can help you cut costs . . . save time . . . increase efficiency.

For Further Information Write:

PENN IRON WORKS, INC.
READING, PENNSYLVANIA

(*Continued from page* 102)

don't remember everything he said; but I know what he was talking about and even if I may not be interested in high-pressure molding I shall be sure to read his "Let's Kick It Around" next time.

A. V. CARLSON
Mechanical Technician
Michigan State College
Department of Mechanical Engineering
East Lansing, Mich.

* * *

Down Time Hurts Profits

TO THE EDITORS:

After reading the editorial "Keep Them Running" in the March issue of FOUNDRY, I would like to comment on the relation of down time to lost operating profit.

In my professional contact with foundries I have found very little consideration is given to measuring losses caused by down time of operating facilities. Neither have I observed this important phase of cost accounting mentioned in lectures and discussions among the many cost meetings held by trade association, technical conferences conducted by the National Association of Cost Accountants and other engineering and accounting group meetings.

Measurement of losses caused by down time should consider:

1. Labor: (a) Possible wages paid an operator while facility is idle; (b) Possible wages paid to indirect labor employees while the facility is idle. (This amount to be only a portion of the department charge as usually indirect labor employees are not reduced when there is idleness of facilities. Thus, in this instance, indirect labor wages become a fixed expense.)

2. Fixed Expenses of Facility: (a) Depreciation (only obsolescence element); (b) Property taxes on building space occupied by the facility, and the facility; (c) Property insurance on building space occupied by the facility, and the facility.

3. Maintenance Cost: (a) Labor; (b) Maintenance department overhead (proportion only).

4. Administrative Expenses: Since this class of expenses is not usually reduced when idleness occurs, a portion is lost and should be so considered when determining the cost of lost time on a facility or facilities. (a) Top executives salaries and office expenses; (b) Operating supervisors; (c) Clerks and other office expenses; (d) Employee taxes, insurance and welfare chargeable to both office and shop labor employees (just the amounts that are considered lost);

(*Continued on page* 106)

FORD CLEVELAND FOUNDRY SAVES MONEY with K&R Core Wire Straighteners

Savings ranging from $75.00 to $150.00 a month are not unusual in foundries using K&R Core Wire Straighteners. Proof that these machines are widely recognized as substantial money-savers is seen in the partial list of K&R users at right. Further proof — scores of foundries, like the Ford Cleveland Foundry shown above, own up to 10.

Since a high degree of straightness is not ordinarily required by the average foundry, K&R straighteners are ideal, for they re-straighten core wire to a usable condition — over and over again — as long as it remains ductile. Machines are made in two sizes — DX-5 for wire 1/8" to 3/8" dia., and F-5 for wire 3/16" to 3/4" dia. Bulletin 58B contains all the facts. Send for it.

A few of the companies now using K&R Straighteners . . .

Allis-Chalmers Mfg. Co.
Aluminum Co. of America
American Steel Foundries
Bohn Aluminum & Brass Corp.
Bonney-Floyd Co.
Cadillac Motor Car Co.
Caterpillar Tractor Co.
Central Foundry, Div. of General Motors
Chevrolet-Saginaw Grey Iron Foundry
The Cooper-Bessemer Corp.—Mt. Vernon, Ohio
The Cooper-Bessemer Corp.—Grove City, Pa.
Crane Co.
Delco-Remy Div. General Motors Corp., Anderson, Ill.
Delco-Remy Div. General Motors Corp., Bedford, Ind.
Dodge Steel Co.
Farrel-Birmingham Co., Inc.
Ford Motor Co.—Windsor, Ont.
Ford Motor Co.—Cleveland, O.
Ford Motor Co.—Detroit, Mich.
General Electric Co.—Erie, Pa.
General Electric Co.—Everett, Mass.
General Malleable Corp.
General Steel Castings Corp.
Goulds Pumps Inc.
Hercules Foundry Div. U. S. Challenge Co.
Ingersoll-Rand Co.
International Harvester Co.
International Motor Co.
John Deere Tractor Co.
McKinnon Industries Ltd.
Minneapolis Moline Power Implement Co.
National Malleable & Steel Castings Co.
Oberdorfer Foundries Inc.
Ohio Steel Foundry Co.
Pacific Car & Foundry Co.
Packard Motor Car Co.
Pittsburgh Steel Foundry Corp.
Pontiac Motor Div. General Motors Corp.
Pratt & Letchworth Co. Inc.
Renault, France
Saginaw Malleable Iron Div. General Motors Corp.
Servel, Inc.
Societe Stein et Roubaiz
St. Louis Steel Casting Co.
Stone & Webster Engineering Co.
Studebaker Corp.
Symington-Gould Corp. (The)
Worthington-Simpson Ltd.
Wright-Aero. Corp.

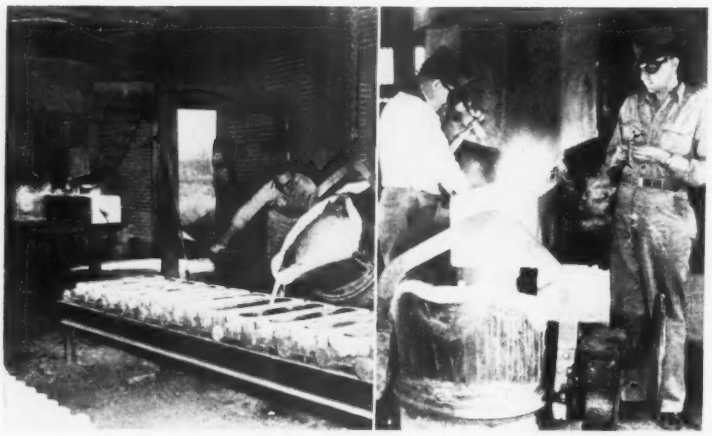
66 Years of Metalworking Experience Built into K&R Machines:

Cold Roll Forming Machines
Bending Rolls — Straightening Rolls
Crimping Machines
Slitting Lines — Flying Shears & Saws
Hydraulic Tube Benders
Hydraulic Bulldozers — Hydraulic Presses
Edging Machines
Special Metalworking Equipment

KANE & ROACH
INCORPORATED
Syracuse, New York
Established 1887

ABC

EXPERIMENTAL CUPOLA
Helps Maintain High Quality of
FOUNDRY COKE



Pouring a test heat from the experimental cupola.

Taking pyrometer reading at experimental cupola.

ABC is the only commercial coke plant in the entire nation that employs a production size cupola to test the regular production of its foundry coke.

Equipment of the cupola is all of standard make and latest design. It is lined to 27" inside diameter and equipped with modern blast controls. Up-to-date apparatus for sulphur and carbon determinations is included in the laboratory equipment. By testing regular production of foundry coke, ABC maintains accurate control of the carbon pickup tendency of its product at all times.

ABC's experimental cupola is only a part of its unsurpassed research program which has helped make ABC foundry coke first choice of discriminating melters in more than 30 States.

Your inquiries are invited.

ALABAMA BY-PRODUCTS CORPORATION

General Sales Office: First National Building, Birmingham, Ala.

Sales Agents:

GREAT LAKES FOUNDRY SAND COMPANY, Detroit; ST. LOUIS COKE & FOUNDRY SUPPLY COMPANY, St. Louis; THE RANSON AND ORR COMPANY, Cincinnati; KERCHNER, MARSHALL AND COMPANY, Pittsburgh; BALFOUR, GUTHRIE & COMPANY, LTD., San Francisco; ATWILL COKE AND COAL COMPANY, Chicago.

(*Continued from page* 104)

(e) Other fixed expenses not covered in the above.

5. Profit: (a) A fair return on investment in land, buildings, equipment and personnel. (No real operating profit is realized until the owners of the plant have recovered the same return on their investment in operating facilities as could be obtained by investing the same amounts elsewhere); (b) Additional profit in a competitive market.

This analysis of elements of operating costs may seem, to the "lay mind," to be too complicated to be of practical use, when considering losses caused by idleness of operating facilities. However, it should provoke serious thought among foundry executives and those entrusted with the problem of measuring losses.

ALBERT E. GROVER
Cost Consultant
4045 *Bluestone Road*
Cleveland Heights 21, *O.*

* * *

How To Make Chaplets Fuse

TO THE EDITORS:

I believe there may be some comment due on the question "Methods for Supporting Core" presented in the March issue. Chaplets comprise one of the big problems in the foundry, as a metal chaplet of the same composition as the casting will seldom be found to have become an intimate part of the casting, and will usually fail to hold the necessary pressure applied to the finished casting.

For this reason, in the steel casting industry it has become almost standard practice to drill out all chaplets in pressure walls and weld up the hole. This method isn't quite so convenient in the nonferrous field. I believe there is a fallacy in your statement concerning the "fusing-in" of chaplets. I cannot see how a chaplet, having the same composition as the metal poured around it, can possibly fuse, there being insufficient heat available in the thin metal layer in direct contact with the chaplet stem, to heat this stem up to the melting temperature, and at least part way through the heat of fusion zone. This was explained rather thoroughly in my article in FOUNDRY for August, 1950.

There is a rather simple way, however, to make this chaplet fuse, or rather become an intimate part of the casting wall, and that is by complete cleanliness. If the chaplet has no oxide or other coating of foreign matter, the metal lying around it will be in molecular contact with the chaplet, and fusion or joining will

(*Concluded on page* 108)

Amazing performance of *MACKLIN* M.M. Carbide Cutting Wheel goes far beyond highest expectations

Yes, sensational economies result from use of this revolutionary wheel. One user reports increased wheel life of 300% with a decrease in both wheel and labor costs. Another states that with equal wheel life the MACKLIN M.M. Wheel produced twice as many tools therefore cutting labor costs 50%. A third asserts grinding time was only 20% of usual with grinding costs reduced by 55%. Many report faster stock removal with grinding time greatly reduced and finishing costs cut up to 50%.

Call your Macklin distributor, or a Macklin field engineer, and let them prove how, you too, can get these cost and labor saving results.

See this great wheel in operation at the Foundry Show — Booth Nos. 712-714

MACKLIN COMPANY

Manufacturers of GRINDING WHEELS AND OTHER ABRASIVE PRODUCTS

JACKSON, MICHIGAN

MACKLIN GRINDING WHEELS

Sales Offices - Birmingham - Buffalo - Chicago - Cincinnati - Cleveland - Columbus - Detroit - Flint - Houston Indianapolis - Los Angeles - Milwaukee - Moline - New York - Philadelphia - Pittsburgh - St. Louis

HAUSFELD
FURNACES

FOR "ALL-OUT" PRODUCTION
IN NON-FERROUS FOUNDRIES

Provide the
Utmost in Speed
Production
and Safety

FURNACES FOR
BRASS • ALUMINUM • MAGNESIUM
AND ALL OTHER
NON-FERROUS ALLOYS

The Campbell-Hausfeld Co.
300-320 MOORE ST. HARRISON, OHIO

(*Concluded from page* 106)

occur by molecular interchange.

A series of tests were run to prove this latter point. A series of gun metal rods about ⅜-in. in diameter were turned from cast stock, placed in the drag part of a mold cavity, and molten gun metal poured around them. "Fusing in" was so incomplete that the rods could almost be pulled out of the casting. The test was repeated, but the rods were cleaned thoroughly with ether and handled with clean cotton gloves. In this test the rods were completely "fused" into the casting, it being almost impossible to find the dividing line even by a microscope.

To prove the practicability of "molecular interchange" in solid metal, two flat gun metal disks were machined and one surface of each ground and polished to provide intimate contact between the two. These, one on top of the other, were heated for ½ hour at 1450° F. On cooling and sectioning, the two disks had become one with no distinct line of demarcation between them.

Of course, the biggest trouble would be to obtain the necessary cleanliness in regular foundry production. However, by acid pickling, thorough washing and drying immediately before placing the chaplets in the mold, handling with clean cotton gloves, then closing and pouring the mold immediately, no difficulty should be experienced in obtaining complete "fusion." However, the cleaned metal surface has only to be touched with the bare fingers or permitted to stand in the foundry for a few minutes to prevent the intimate contact necessary to molecular interchange. If it could be tolerated in the case in question, it might be possible to place a thin dip coating of tin on the chaplet immediately before placing them in the mold. This would provide a low melting constituent which would alloy with both the chaplet and the surrounding casting. Cleanliness still is required.

CLYDE L. FREAR

Bureau of Ships
Department of the Navy

* * *

Enjoys ABC Articles

TO THE EDITORS:

Now that Pat Dwyer no longer is with us, I hope that his passing will not remove all the features which he wrote, especially the "A.B.C.'s of Foundry Practice." We, who are new at the foundry trade, enjoy these discussions of its basic phases.

Might I suggest that an article or two be devoted to a description and discussion of the molder's tools.

ROBERT B. NEWMANN

Roscoe, O.

Sterling INVITES YOU to the 1954 Cleveland Parade of Foundry Progress!

1904 GOLDEN ANNIVERSARY 1954

Sterling
STEEL FLASKS
used in more than 13,000 FOUNDRIES all over the world.

Come to Cleveland, May 8th to 14th . . . see the exhibits at American Foundrymen Society's 58th Convention . . . study the progressively modern processes and machines . . . review the soundly engineered advantages Sterling offers you in Foundry Flasks that have won world-wide leadership. In addition to their unequalled combination of maximum strength and minimum weight, Sterling Foundry Flasks have foundry-favored features you need. Practical foundrymen prefer the Sterling line. Now over 13,000 foundries, world-wide, use them. Write for "Sterling's Golden Anniversary Catalog" . . . or see your nearby Sterling Branch Office or Dealer.

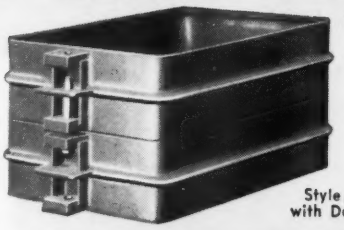
STERLING WHEELBARROW COMPANY
MILWAUKEE 14, WISCONSIN, U. S. A.
Subsidiary Company: STERLING FOUNDRY SPECIALTIES LTD., ENGLAND

Sterling ...THE ORIGINAL and ONLY *Rolled Steel Channel* FOUNDRY FLASKS

Sterling EQUIPMENT for HEAVY-DUTY FOUNDRY SERVICE

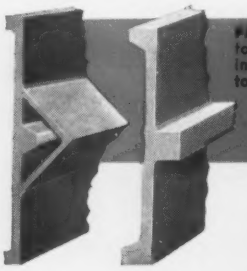
FOUNDRY CARTS and TRUCKS: Designed and built for tough foundry service, the Sterling line of wheelbarrows, carts and trucks can be depended upon to take everyday punishment. Cost less per year of service.

FOUNDRY FLASKS and ACCESSORIES: Special rolled steel channel, reinforced and welded into one solid, rigid unit, permits Sterling Foundry Flasks to resist tremendous pressures. Maximum strength is combined with light weight to make these the preferred foundry flasks throughout the world.

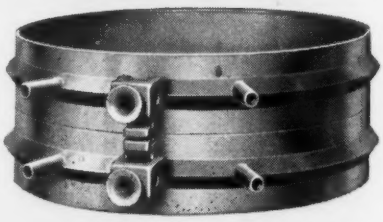


Style AD Flask with Double Lugs.

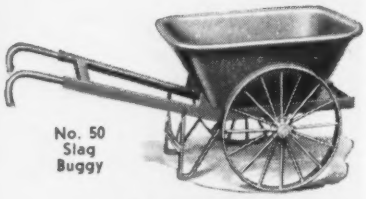
No. 116-A Heavy-Duty Wheelbarrow



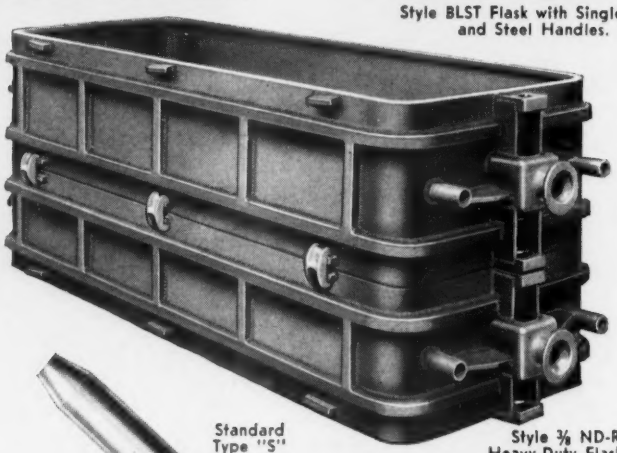
PARTINGS precision machined to .005" for tight fit. Reinforcing bars or angles are welded to assure one-piece rigidity and strength. Double reinforcing bars and special sand strips on cope and drag add strength and rigidity.



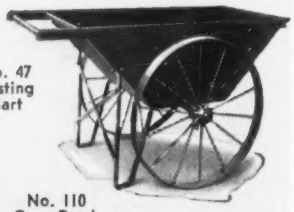
Style BLST Flask with Single Lugs and Steel Handles.



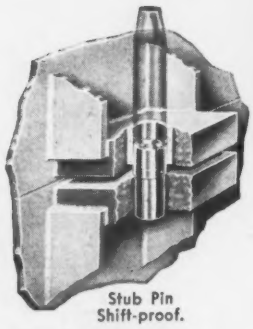
No. 50 Slag Buggy



Style ⅜ ND-RTX Heavy-Duty Flask with Reinforcing Strips.

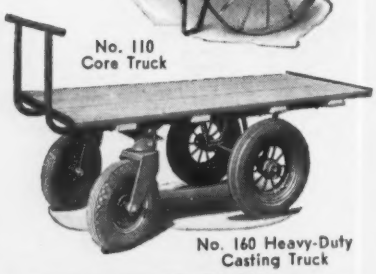


No. 47 Casting Cart



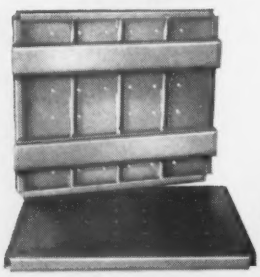
Stub Pin Shift-proof.

Standard Type "S" Flask Pin.

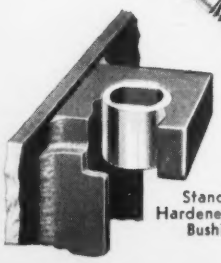


No. 110 Core Truck

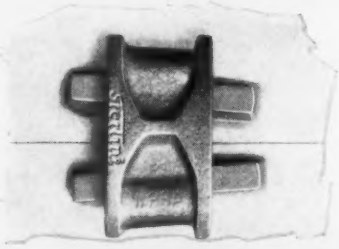
No. 160 Heavy-Duty Casting Truck



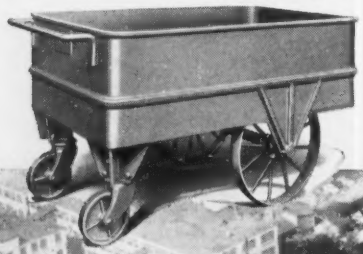
Squeeze-in Board.

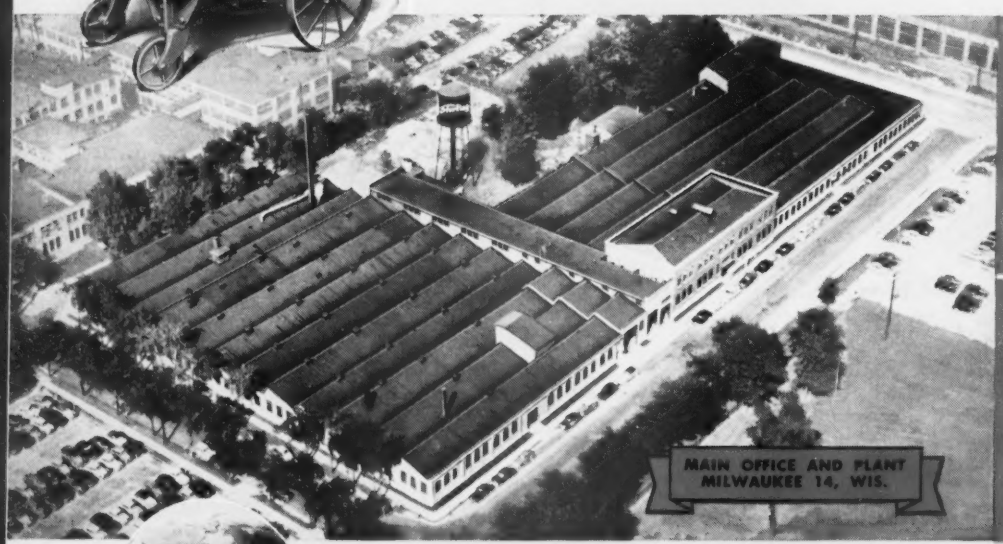


Standard Hardened Steel Bushing.



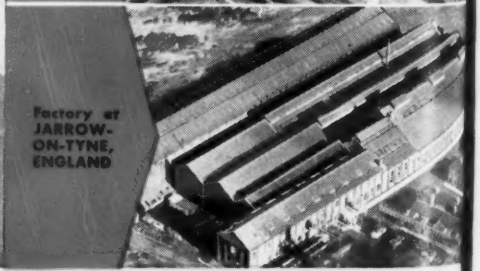
Sterling Flask Clamp.





MAIN OFFICE AND PLANT MILWAUKEE 14, WIS.

Factory at BEDFORD, ENGLAND



Factory at JARROW-ON-TYNE, ENGLAND

WORLD WIDE SERVICE

STERLING WHEELBARROW COMPANY

MAIN OFFICE and PLANT: MILWAUKEE 14, WISCONSIN, U. S. A.

Subsidiary Company: STERLING FOUNDRY SPECIALTIES LTD., ENGLAND

SALES OFFICES AT LONDON and BEDFORD — FACTORIES AT BEDFORD and JARROW ON TYNE

Have You Kept Pace?

During the past half century, the foundry industry has tended toward greater use of machinery in production processes. The movement was accentuated during World War I, but the greatest impetus was provided by the tremendous growth of the automobile industry and the consequent demand for huge quantities of castings. As the benefits of machine production became apparent, the use of such equipment spread through practically the entire industry.

Shortages of manpower, coupled with the unprecedented requirements for castings during World War II, again emphasized the need for equipment in foundries, and this situation was further accentuated during the postwar period when pent-up demands for goods raised the consumption of castings to record heights. The trend continued during the Korean war.

How well have foundries kept pace with modernization and mechanization? To answer this question and to provide a bench mark for future thinking, *Foundry* is presenting in this issue an extensive inventory of foundry equipment. It reveals that while the industry has made great strides in acquiring new machines during the past few years, much remains to be done if obsolete equipment is to be replaced with modern facilities. Also striking is the revelation that many of the larger foundries have the oldest equipment.

As the national economy moves from war to troubled peace, with its accompanying lower demand for castings, greater competition for available business and continued high cost of labor, the factor of equipment still remains of great interest and importance to many foundrymen. But the degree of application varies widely. For example, some organizations are looking toward the ultimate in automatic equipment. Others are considering modernizing through rearrangement of facilities as well as further application of machinery. Some believe that mechanization in their shops has progressed as far as needed, and the future will be concerned with replacement of obsolete and worn-out equipment. Available equipment for use in small foundries is receiving considerable study by the industry. Foundrymen looking for information in any of these fields of improvement, as well as in foundry materials and services, will find much of interest in this issue of *Foundry* and at the record-breaking AFS show which will open in Cleveland, May 8.

Whatever the future holds, foundries need to study carefully the developments and refinements which have been made by the equipment and supplies industries. If it is peace, competitive factors necessitate steps to improve product and reduce production costs. If it is another national emergency, the demand is for tremendous production.

Now is the golden opportunity to study the field.

Frank G. Steinebach

Editor

CLEVELAND ... Host to

AFS Convention

Comprehensive technical program and extensive exhibit of foundry equipment and supplies to be presented May 8-14. Plant visits, annual banquet and ladies' entertainment are additional features

FOR the ninth time Cleveland will welcome foundrymen of the United States and foreign countries when the American Foundrymen's Society holds its 58th annual convention in that city, May 8-14.

Hub of the week's activities will be Cleveland Public Auditorium. It will be registration headquarters as well as the site of the Foundry Show, the annual banquet and the majority of technical and business meetings. The show, described in more detail starting on page 122, promises to be the most comprehensive exhibit of foundry equipment and supplies ever sponsored by the society.

While the Foundry Show is to be open all day Saturday, May 8, technical sessions will not get under way until Monday at 10 a.m. No activities are scheduled for Sunday, and both the show and technical program will be concluded at 1 p.m. Friday, May 14.

The large number of advance registrations and requests for hotel reservations assures a convention attendance that will rival if not exceed those of the highly successful meetings in Cleveland in 1950 and 1946. The numerous important developments in both operating practice and in foundry equipment that are to be discussed and seen comprise the magnet that will draw the interest of visiting foundrymen.

Plant Inspection—An added attraction for visitors will be the opportunity to inspect 15 local foundries and pattern shops. These plants, which are co-operating with Northeastern Ohio Chapter in holding open-houses during the week, include the huge Ford Cleveland Foundry. For further details on plant visits see page 131.

Technical Program—Papers and discussions arranged for the technical program have been selected to cover the broadest possible interests of foundrymen. Subjects range from the theoretical to practical shop practice. They include such topics as titanium casting, shell molding, die casting, plaster molding, investment casting and centrifugal casting—in addition to conventional sand casting of ferrous and nonferrous metals. The complete list of papers and authors starts on page 116.

Technical sessions are arranged so that those pertaining to brass and bronze, malleable iron, patternmaking and light metals are concentrated on Monday and Tuesday. Sand, steel and gray iron sessions will be held on Wednesday, Thursday and Friday. Meetings on ventilation, safety and air pollution subjects are scheduled for Tuesday, Wednesday and Thursday. Other subjects and the session dates include education on Tuesday, refractories and plant equipment on Wednesday, and heat transfer on Wednesday and Thursday.

Shop Courses—An expanded program of practical shop courses is planned this year. Sessions

Charles Edgar Hoyt Annual Lecture

Harry W. Dietert will present the 1954 Charles Edgar Hoyt Annual Lecture on Wednesday morning, May 12, during the AFS Cleveland convention. His paper, titled "Processing Molding Sand," will comprise a detailed discussion of how materials are processed to obtain molding sands that possess properties necessary for the production of high-quality castings. Mr. Dietert, chairman, Harry W. Dietert Co., Detroit, was graduated from Iowa State College. He joined U. S. Radiator Corp., Detroit, in 1923, resigning in 1936 as chief engineer to devote full time to his own company, which he founded in 1925. Mr. Dietert is a national AFS director and was awarded the McFadden gold medal in 1940.

HARRY W. DIETERT

will be conducted by the Gray Iron, Brass and Bronze, Sand and Malleable Divisions and, for the first time, by the Refractories Committee. Those attending only the shop courses will not be required to pay the customary registration fee, which for the entire convention is $2 for AFS members and $5 for nonmembers. Dates of the shop courses and subjects to be covered are:

Gray Iron—Monday evening, "Coke Screening and Its Relation to Cupola Operation"; Tuesday evening, "Gating To Control Pouring Rate and Its Effect on Casting Quality"; Thursday evening, "Cupola Bed Practice."

Brass and Bronze—Monday afternoon, "Coreboxes, Ovens and Driers"; Tuesday afternoon, "Developments in Coremaking."

Sand—Monday, Tuesday and Thursday evenings, "Fundamentals of Sand Control."

Malleable Iron—Monday afternoon, "Melting Malleable Iron"; Tuesday afternoon, "Malleable Annealing Practice."

Refractories—Thursday afternoon, "The Importance of Refractories in Your Foundry."

Dinners and Luncheons—The AFS annual banquet will be held in the Arena of Public Auditorium Wednesday evening, with President Collins L. Carter presiding. High light of the evening will be the presentation of gold medals and honorary life memberships in the society to six outstanding foundrymen. Details concerning these awards are given on pages 126-127. There will be no guest speaker, and the evening will be concluded with a program of professional entertainment.

Canadian visitors and their friends—this time including the ladies—will gather for their annual dinner on Tuesday evening.

Here is the schedule of roundtable luncheons for the various divisions: Light Metals, Monday noon; Education, Brass and Bronze, Malleable and Sand, Tuesday noon; Gray Iron and Pattern, Wednesday noon; Steel, Thursday noon.

The Sand Division roundtable will have as its theme, "What's in the Future?" and will comprise brief reports by all committee chairmen on past activities and plans for future investigations. This is intended to be an opportunity for members to

COMMITTEE MEETINGS

VARIOUS committees and divisions of the American Foundrymen's Society will hold business meetings during the Cleveland convention. Tentative schedule of these meetings follows:

Monday

Apprentice Contest Committee of the Educational Division, 10 a.m. and 2 p.m. in Public Auditorium.

Industrial Engineering Committee, 4 p.m. in Public Auditorium.

Tuesday

Shell Molding Committee of the Light Metals Division, 9 a.m. in Public Auditorium.

Chill Test Committee of the Gray Iron Division, 10 a.m. in Public Auditorium.

Sand Division. In lieu of a regular business meeting, the Sand Division will hold a roundtable luncheon at 12 noon in Hotel Hollenden. Chairmen of all of the division's committees will present reports concerning individual activities of their groups and plans for future work.

Centrifugal Casting Committee of the Light Metals Division, 4 p.m. in Public Auditorium.

Pattern Divison, 8 p.m. in Hotel Cleveland.

Wednesday

Cupola Research Committee 8:30 a.m. in Public Auditorium.

Gray Iron Division, 2 p.m. in Public Auditorium.

Heat Transfer Committee, 4 p.m. in Public Auditorium.

Plant and Plant Equipment Committee, business meeting to follow 4 p.m. technical session in Public Auditorium.

Thursday

Mold Surface Committee of the Sand Division, 9 a.m. in Public Auditorium.

Standard Test Patterns Committee of the Sand Division, 4 p.m. in Public Auditorium.

Steel Division, annual business meeting to follow roundtable luncheon at 12 noon in Hotel Cleveland.

Physical Properties of Steel Foundry Sands at Elevated Temperatures Committee of the Sand Division, 7 p.m. in Hotel Cleveland.

offer suggestions and criticism concerning the committees' past and proposed activities.

Annual Meeting—Presentation of reports on the past year's work of the society and election of new officers and directors for 1954-55 will take place at the annual business meeting Wednesday morning, May 12. Following are the officers and directors who have been nominated:

President—Frank J. Dost, president, Sterling Foundry Co., Wellington, O. Vice president—Bruce L. Simpson, president, National Engineering Co., Chicago.

Directors for three years—Harold L. Ullrich, works manager, Sacks-Barlow Foundries Inc., Newark, N. J.; William A. Morley, foundry manager, Link-Belt Co., Olney Foundry, Philadelphia; Eugene R. Oeschger, general manager, foundry department, General Electric Co., Schenectady, N. Y.; Frank C. Cech, instructor, Cleveland Trade School, Cleveland; W. M. Hamilton, manager, Crane Co., Chattanooga, Tenn.; B. G. Emmett, works manager, Los Angeles Steel Casting Co., Los Angeles.

W. R. Pindell, manager, Northwest Foundry & Furnace Works Inc., Portland, Oreg., is a nominee for a two-year directorship, and J. T. Westwood Jr., president, Blue Valley Foundry Co., Kansas City, Mo., has been nominated for one year. Collins L. Carter automatically becomes a director for one year as retiring national president.

In addition to selections of the Nominating Committee, these three individuals have been nominated as directors by the AFS board: Claude B. Schneible, Claude B. Schneible Co., Detroit, for one year; Charles Brust, Eastern Malleable Iron Co., Naugatuck, Conn., for two years; L. H. Durdin, Dixie Foundry Co., Birmingham, for three years.

Also on the annual meeting program will be the awarding of prizes in the 1954 apprentice contest. This year's competition drew the largest number of entries in history. Twelve AFS chapters sponsored local contests. Three cash prizes are established for each of these divisions: gray iron, steel and nonferrous molding; wood and metal patternmaking.

LADIES' PROGRAM

AN ATTRACTIVE ladies' program is scheduled for convention week by the Ladies' Entertainment Committee under the direction of Mrs. Stephen E. Kelly, chairman, and Mrs. David Clark Jr., vice chairman. Registration headquarters will be on the mezzanine of Hotel Cleveland in charge of Mrs. Clark and Mrs. Howard E. Heyl. Guests may register between 1 and 4 p.m. on Sunday, May 9, and all day Monday through Thursday morning.

Monday

Tea will be served in the Hotel Cleveland ballroom from 3 to 4:30 p.m. under the direction of Mrs. Walter L. Seelbach and Mrs. Alexander D. Barczak. Entertainment will be provided by a string trio led by Jack Pollack, leader of the Hanna theater orchestra and cellist with the NBC radio network orchestra. Formerly, he had a national radio program known as "Music from Hollywood."

Tuesday

A luncheon and floor show, featuring stage and television stars will be held at the Alpine Village, theater restaurant. Manager Herman Pirchner promises several pleasant surprises in addition to the revue. Arrangements for the luncheon are in charge of Mrs. Lewis T. Crosby and Mrs. F. Ray Fleig.

Wednesday

The American Foundrymen's Society annual banquet at Public Auditorium.

Thursday

Luncheon and a demonstration of flower and fruit arrangements by Irene Jones, flower stylist of Knoble's Flowers Inc., at Westwood Country Club will conclude the ladies' program. Mrs. Jones has been a flower arranger for Knoble's for 12 years. Widely known for her lectures and demonstrations, she has been featured on television programs. The program is under the direction of Mrs. Harold Strater and Mrs. Frank J. Dost.

CONVENTION

SATURDAY, MAY 8

9 a.m.—Registration opens, Public Auditorium

9:30 a.m.—Exhibits open. Northeastern Ohio Day. (Free admission for local plant employees)

5:30 p.m.—Exhibits close

MONDAY, MAY 10

9 a.m.—Registration opens

9:30 a.m.—Exhibits open

10 a.m.—Brass and Bronze Session
Presiding, H. J. Roast, Consultant, Ottawa, Ont.; vice chairman, R. A. Colton, Federated Metals Division, American Smelting & Refining Co., Barber, N. J.
Ornamental Yellow Brass Castings Gated for Greater Economy, C. L. Mack, Chautauqua Hardware Corp., Jamestown, N. Y.
Some Experiences in the Shell Molding of Copper-Base Alloys, S. S. Brown and H. K. Worner, W. O. & B. Adams Pty Ltd., Melbourne, Australia —(Presented by B. N. Ames, Doran Manganese Bronze Corp., Brooklyn, N. Y.)

10 a.m.—Light Metals Session
Presiding, R. T. Wood, Aluminum Co. of America, Pittsburgh; vice chairman, W. Danks, Howard Foundry Co., Chicago
Gating and Risering of Magnesium Alloys, H. E. Elliott, Dow Chemical Co., Bay City, Mich.
Segregation in Magnesium—Rare Earth—Zinc—Zirconium Alloys, H. M. Skelly, Aluminum Laboratories Ltd., Kingston, Ont., and D. C. Sunnucks, Aluminum Co. of Canada, Montreal
Beryllium in Magnesium Die Casting Alloys, F. L. Burkett, Dow Chemical Co., Midland, Mich.

10 a.m.—Malleable Session
Presiding, R. V. Osborne, Lakeside Malleable Castings Co., Racine, Wis.; vice chairman, H. C. Stone, Belle City Malleable Iron Co., Racine, Wis.
Effect of Plastic Deformation of Hard Iron on Subsequent Annealing, W. K. Bock, National Malleable & Steel Castings Co., Cleveland
Prebaking Effect in Malleablizing, Floyd Brown, North Carolina State College, Raleigh, N. C.

12 noon—Light Metals Roundtable Luncheon
Presiding, W. E. Sicha, Aluminum Co. of America, Cleveland; vice chairman, R. F. Thomson, General Motors Research Laboratories, Detroit
Principles of Vertical Gating—Progress Report Light Metals Research—J. G. Kura, Battelle Memorial Institute, Columbus, O.
Transparent Plastic Mold Models for Study of Fluid Flow Characteristics in Investment Molds, D. G. McCullough, F. J. Webber and R. F. Thomson, General Motors Research Laboratories, Detroit

2 p.m.—Brass and Bronze Session
Presiding, F. L. Riddell, H. Kramer & Co., Chicago; vice chairman, A. W. Bardeen, Ohio Brass Co., Mansfield, O.
Research in Progress for the Bureau of Ships, Department of the Navy, W. H. Baer, Bureau of Ships, Navy Department, Washington
Valve Stem Dezincification, R. H. Hanlon, Kennedy Valve Mfg. Co., Elmira, N. Y.
Pressure Molding for Copper-Base Alloys, Tom E. Barlow, Eastern Clay Products Department, International Minerals & Chemical Corp., Chicago
Melt Quality Tests for Bronze Alloys, Howard F. Taylor, Massachusetts Institute of Technology, Cambridge, Mass.

2 p.m.—Pattern Session
Presiding, E. T. Kindt, Kindt-Collins Co., Cleveland; vice chairman, G. E. Garvey, City Pattern & Foundry Co., South Bend, Ind.
Investment Casting by the Frozen Mercury Process, I. R. Kramer, Mercast Corp., New York
Blow-In Driers, Robert Wendt, Industrial Pattern Works, Chicago

2 p.m.—Malleable Session
Presiding, W. A. Kennedy, Grinnell Co., Providence, R. I.; vice chairman, G. B. Mannweiler, Eastern Malleable Iron Co., Naugatuck, Conn.
Some Effects of Melting Furnace Atmospheres on Tensile Properties and Annealability of Malleable Iron—Progress Report on Malleable Research, R. W. Heine, University of Wisconsin, Madison, Wis.
Strength of Some White Irons in the Temperature Range of Hot Tearing, J. P. Frenck and R. W. Heine, University of Wisconsin, Madison, Wis.

4 p.m.—Brass and Bronze Shop Course
Presiding, M. G. Dietl, Schaible Co., Cincinnati
Core Boxes and Driers, Robert Wendt, Industrial Pattern Works, Chicago
Core Ovens, C. H. Barnett, Foundry Equipment Co., Cleveland

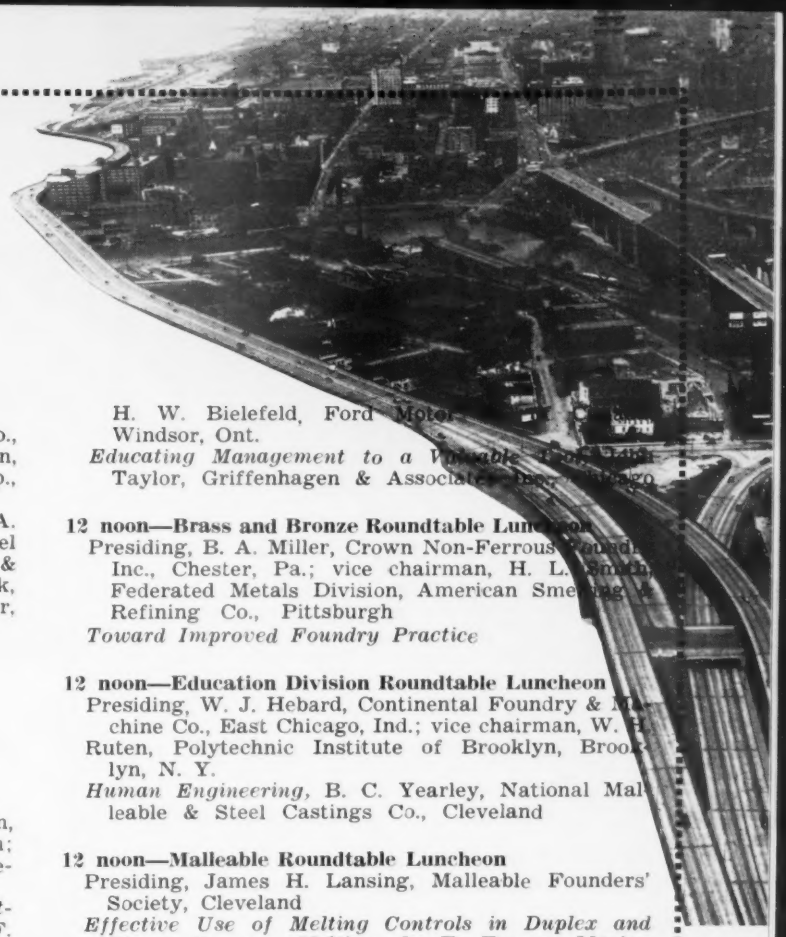
4 p.m.—Light Metals Session
Presiding, D. L. LaVelle, American Smelting & Refining Co., South Plainfield, N. J.; vice chairman, F. P. Strieter, Die Casting Division, Dow Chemical Co., Midland, Mich.
New Aluminum Die Casting Alloys, D. L. Colwell and E. Trela, Apex Smelting Co., Cleveland
Mechanical Properties of Aluminum Die Casting Alloys, C. O. Smith, Aluminum Research Laboratories, Aluminum Co. of America, New Kensington, Pa.
Some Factors Affecting Fatigue Strength of Aluminum Alloy Sand Castings, Marshall Holt, Aluminum Research Laboratories, Aluminum Co. of America, New Kensington, Pa.

4 p.m.—Malleable Shop Course
Presiding, Milton Tilley, National Malleable & Steel Castings Co., Cleveland; vice chairman, W. M. Albrecht, Chain Belt Co., Milwaukee
Cupola Melting Fundamentals, R. W. Heine, University of Wisconsin, Madison, Wis.
Cupola Melting at Belle City Malleable, Frank Lapour, Belle City Malleable Iron Co., Racine, Wis.
Cupola Melting at Auto Specialties, R. H. Greenlee, Auto Specialties Mfg. Co., St. Joseph, Mich.

5:30 p.m.—Non-Ferrous Founders' Society, Dinner, ballroom, Carter Hotel

8 p.m.—Gray Iron Shop Course
Presiding, Howard H. Wilder, Vanadium Corp. of America, Detroit; vice chairman, E. J. Burke, Hanna Furnace Corp., Buffalo
Coke Screening and Its Relation to Cupola Operation —Discussion leader, W. W. Holden, Eaton Mfg. Co., Vassar, Mich.

PROGRAM



8 p.m.—Sand Shop Course
Presiding, R. H. Olmsted, Whitehead Bros. Co., Conneaut, O.; vice chairman, Robert Fredrickson, Central Foundry Division, General Motors Corp., Saginaw, Mich.
Fundamentals of Sand Control: Moderator, C. A. Sanders, American Colloid Co., Chicago. Panel members—D. L. LaVelle, American Smelting & Refining Co., South Plainfield, N. J.; C. A. Robeck, Gibson & Kirk Co., Baltimore; Eric Welander, John Deere Malleable Works, East Moline, Ill.

TUESDAY, MAY 11

9:30 a.m.—Exibits open

10 a.m.—Brass and Bronze Session
Presiding, H. L. Smith, Federated Metals Division, American Smelting & Refining Co., Pittsburgh; vice chairman, R. J. Sahm Jr., Lava Crucible-Refractories Co., Chicago
Application of Chills to Improving Pressure Tightness of Gun Metal (88-8-4), W. H. Johnson, H. F. Bishop and W. S. Pellini, Metallurgy Division, Naval Research Laboratory, Washington
Some Factors Affecting Metal Penetration of Navy "M" Bronze in Cores, R. B. Fischer, Ingersoll-Rand Co., Phillipsburg, N. J.

10 a.m.—Light Metals Session
Presiding, R. F. Cramer, General Electric Co., Schenectady, N. Y.; vice chairman, K. B. Bly, Fabricast Division, General Motors Corp., Bedford, Ind.
Effect of Centrifugal Force on Structure and Mechanical Properties of Aluminum Casting Alloy C4, O. Z. Rylski, A. Couture, and J. W. Meier, Department of Mines and Technical Surveys, Ottawa, Ont.
Techniques for Improving Strength and Ductility of Aluminum Alloy Castings, W. D. Walther, C. M. Adams and H. F. Taylor, Massachusetts Institute of Technology, Cambridge, Mass.

10 a.m.—Malleable Session
Presiding, W. D. McMillan, International Harvester Co., Chicago; vice chairman, R. A. Schneidewind, University of Michigan, Ann Arbor, Mich.
Graphitization of Rims in Malleable Iron, H. A. Schwartz and J. D. Hedberg, National Malleable & Steel Castings Co., Cleveland
Effect of Atmospheres on the Rate of Anneal of Black Heart Malleable Iron, J. E. Rehder, Canada Iron Foundries Ltd., Montreal

10 a.m.—Pattern Session
Presiding, Vaughan C. Reid, City Pattern Foundry & Machine Co., Detroit; vice chairman, J. W. Costello, American Hoist & Derrick Co., St. Paul
Pattern Equipment for Shell Molding, O. C. Bueg, Arrow Pattern & Engineering Co., Erie, Pa.
Use of Plastics in Patternmaking, W. C. H. Dunn, Western Pattern Works Inc., Montreal

10 a.m.—Industrial Engineering Session
Presiding, J. J. Farkas, Cincinnati Milling Machine Co., Cincinnati; vice chairman, Dean Van Order, Burnside Steel Foundry Co., Chicago
Time Distance Charts—Analysis of Work Content, Time, Distance and Speed at Conveyor Stations, H. W. Bielefeld, Ford Motor [illegible], Windsor, Ont.
Educating Management to a Valuable [illegible] Taylor, Griffenhagen & Associates [illegible], Chicago

12 noon—Brass and Bronze Roundtable Luncheon
Presiding, B. A. Miller, Crown Non-Ferrous Foundry Inc., Chester, Pa.; vice chairman, H. L. Smith, Federated Metals Division, American Smelting & Refining Co., Pittsburgh
Toward Improved Foundry Practice

12 noon—Education Division Roundtable Luncheon
Presiding, W. J. Hebard, Continental Foundry & Machine Co., East Chicago, Ind.; vice chairman, W. H. Ruten, Polytechnic Institute of Brooklyn, Brooklyn, N. Y.
Human Engineering, B. C. Yearley, National Malleable & Steel Castings Co., Cleveland

12 noon—Malleable Roundtable Luncheon
Presiding, James H. Lansing, Malleable Founders' Society, Cleveland
Effective Use of Melting Controls in Duplex and Direct Furnace Melting, L. E. Emery, Marion Malleable Iron Works, Marion, Ind.; E. T. Price, Cadillac Malleable Iron Co., Cadillac, Mich.

12 noon—Sand Roundtable Luncheon
Presiding, F. S. Brewster, Harry W. Dietert Co., Detroit; vice chairman, O. J. Myers, Archer-Daniels-Midland Co., Minneapolis
What's in the Future?—Five-minute talks by all Sand Division Committee chairmen

2 to 5 p.m.—Light Metals Session
Presiding, O. W. Simmons, Rem-Cru Titanium Inc., Midland, Pa.; vice chairman, R. F. Malone, Rem-Cru Titanium Inc., Midland, Pa.
A Bottom-Pour, Arc Type Furnace for the Melting and Casting of Titanium, O. W. Simmons, Rem-Cru Titanium Inc., H. R. McCurdy and R. E. Edelman, Pitman-Dunn Laboratories, Frankford Arsenal, Philadelphia
Mechanical Properties of Cast Titanium-Aluminum Alloys, R. E. Edelman, and A. Tabak, Pitman-Dunn Laboratories, Frankford Arsenal, Philadelphia
Expendable Molds for Titanium Castings, R. M. Lang, J. Gissy, G. H. Schippereit and J. G. Kura, Battelle Memorial Institute, Columbus, O.
Techniques for Producing Titanium Alloy Castings, M. Glassenberg and M. J. Berger, Armour Research Foundation, Chicago

2 p.m.—Education Session
Presiding, Frank W. Shipley, Caterpillar Tractor Co., Peoria, Ill.; vice chairman, W. F. Graden, Simonds Abrasive Co., Philadelphia
Developing All Levels of Management, D. F. Lane, National Foreman's Institute, New York
A Short Course in Foundry Skills, Arthur Agostini, Grede Foundries Inc., Milwaukee

2 p.m.—Plaster Mold Casting Session
Presiding, H. Rosenthal, Pitman-Dunn Laboratories, Frankford Arsenal, Philadelphia; vice chairman, G. R. Gardner, Cleveland Research Division, Aluminum Co. of America, Cleveland
Improving the Thermal Conductivity and Economy of Foam Plaster Molds, R. F. Dalton, Hills-McCanna Co., Chicago

Some Practical Applications for Expansion Plaster, O. H. Harer, Scientific Cast Products Corp. of Illinois, Chicago

History and Development of Plaster Mold Castings, K. A. Miericke, Baroid Sales Division, National Lead Co., Chicago

2 to 5 p.m.—Dust Control and Ventilation Session

Presiding, R. S. Dahmer, Foundry Division, Eaton Mfg. Co., Vassar, Mich.; vice chairman, W. W. Dodge, Caterpillar Tractor Co., Peoria, Ill.

Progress Report—AFS Safety, Hygiene and Air Pollution Control Program, J. R. Allan, International Harvester Co., Chicago

Foundry Hygiene Problems, H. J. Weber, American Brake Shoe Co., Chicago

Principles of Foundry Ventilation (a demonstration), B. B. Bloomfield, Division of Occupational Health, Michigan Department of Health, Lansing, Mich.

Principles of Exhaust Ventilation, W. W. Dodge, Caterpillar Tractor Co., Peoria, Ill.

Ventilation of Sand Handling Equipment, F. C. Fluegge, International Harvester Co., Chicago

Cooling of Castings, T. J. Glaza, Crane Co., Chicago

Principles of Effective Maintenance of Foundry Ventilation and Dust Collecting Equipment, K. M. Smith, Caterpillar Tractor Co., Peoria, Ill.

2 p.m.—Industrial Engineering Session

Presiding, C. J. Pruet, McWane Cast Iron Pipe Co., Birmingham; vice chairman, R. E. Evert, Foundry Division, Eaton Mfg. Co., Vassar, Mich.

An Incentive Plan for "Line" Supervisors, E. D. Bolden, Westover Engineers, Milwaukee

A Measured Daywork Program, L. W. Lehmann, John Deere Van Brunt Co., Horicon, Wis.

4 p.m.—Brass and Bronze Shop Course

Presiding, M. G. Dietl, Schaible Co., Cincinnati

Practical Know-How of Core Blowing and Machine Maintenance, G. E. Miller, Cleveland

Oil Bonded and Resin Bonded Cores, W. B. Bishop, Archer-Daniels-Midland Co., Cleveland

4 p.m.—Malleable Shop Course

Presiding, Eric Welander, John Deere Malleable Works, East Moline, Ill.; vice chairman, William Zeunik, National Malleable & Steel Castings Co., Indianapolis

Malleable Annealing Practice. Panel members: J. T. Bryce, Albion Malleable Iron Co., Albion, Mich.; F. W. Jacobs, Texas Foundries Inc., Lufkin, Tex.; L. R. Jenkins, Wagner Malleable Iron Co., Decatur, Ill.

4 p.m.—Education Session

Presiding, Fred G. Sefing, International Nickel Co., New York; vice chairman, Earl M. Strick, Erie Malleable Iron Co., Erie Pa.

What Does the Foundry Industry Want AFS To Do in Educational Work on the Local Chapter Level? Panel members: R. M. Reese, supervisor of trade and industrial education, State of Ohio, Columbus, O.; H. E. Mandel, Pennsylvania Foundry Supply & Sand Co., Philadelphia; Earl M. Strick, Erie Malleable Iron Co., Erie, Pa.,; B. C. Yearley, National Malleable & Steel Castings Co., Cleveland; A. B. Sinnett, American Foundrymen's Society, Chicago

6 p.m.—Canadian Dinner—Hotel Cleveland

8 p.m.—Gray Iron Shop Course

Presiding, K. H. Priestley, Vassar Electroloy Products Inc., Vassar, Mich.; vice chairman, L. L. Clark, Armour Research Foundation, Chicago

Gating To Control Pouring Rate and Its Effect on Casting Quality: Discussion leader, F. J. McDonald, Central Foundry Division, General Motors Corp., Saginaw, Mich.; alternate discussion leader, C. B. Stone, Lynchburg Foundry Co., Lynchburg, Va.

8 p.m.—Sand Shop Course

Presiding, F. S. Brewster, Harry W. Dietert Co., Detroit

Fundamentals of Sand Control. Moderator, C. A. Sanders, American Colloid Co., Chicago. Panel members—W. R. Jennings, John Deere Tractor Co., Waterloo, Iowa; L. E. Wile, Lynchburg Foundry Co., Lynchburg, Va.; John Clarke, General Electric Co., Erie, Pa.

WEDNESDAY, MAY 12

9:30 a.m.—AFS Annual Business Meeting
Presiding, AFS National President, Collins L. Carter, Albion Malleable Iron Co., Albion, Mich.
President's Annual Address
Apprentice Contest Awards
Election of Officers and Directors
Charles Edgar Hoyt Annual Lecture: *The Processing of Molding Sands,* Harry W. Dietert, Harry W. Dietert Co., Detroit

12 noon—Exhibits open

12 noon—Gray Iron Roundtable Luncheon
Presiding, J. S. Vanick, International Nickel Co., New York
High Lights of Our European Trip, L. N. Shannon, Stockham Valves & Fittings Inc., Birmingham
European Metallurgy and Melting Practice, J. E. Rehder, Canada Iron Foundries Ltd., Montreal
European Molding, Core Making and Production Equipment, F. M. Kulka, Motor Castings Co., Milwaukee

12 noon—Pattern Roundtable Luncheon
Presiding, A. F. Pfeiffer, Allis-Chalmers Mfg. Co., Milwaukee; vice chairman, H. J. Jacobson, Industrial Pattern Works, Chicago
Accuracy and Tolerances for Patterns, George Webber, Webber Gage Co., Cleveland
Panel discussion: *Pattern Development and Problems* (Question and Answer Period)

2 p.m.—Steel Session
Presiding, C. H. Wyman, Burnside Steel Foundry Co., Chicago; vice chairman, J. A. Rassenfoss, American Steel Foundries, East Chicago, Ind.
Stress Required to Hot Tear Plain Carbon Cast Steel: Effects of Tearing Temperature, Composition and Deoxidation Practice, H. K. Bhattacharya, C. M. Adams Jr., and H. F. Taylor, Massachusetts Institute of Technology, Cambridge, Mass.
Influence of Core Material on Hot Tearing of Steel Castings, Progress Report, Steel Research Committee—C. H. Wyman, chairman, Burnside Steel Foundry Co., Chicago
Report on Metallurgical Investigation at Armour Research Foundation, L. L. Clark, Armour Research Foundation, Chicago
Panel Discussion: H. H. Blosjo, Minneapolis Electric Steel Castings Co., Minneapolis; J. B. Caine, consultant, Cincinnati; Charles Locke, West Michigan Steel Castings Co., Muskegon, Mich.; W. S. Pellini, Naval Research Laboratory, Washington; J. A. Rassenfoss, American Steel Foundries, East Chicago, Ind.; C. M. Adams Jr., Massachusetts Institute of Technology, Cambridge, Mass.; C. J. Zilch, Bucyrus-Erie Co., South Milwaukee, Wis.; D. C. Zuege, Sivyer Steel Casting Co., Milwaukee

2 p.m.—Sand Session
Presiding, E. L. Buchman, Cleveland Foundry Division, Ford Motor Co., Cleveland; vice chairman, T. A. Tarquinio, American Manganese Steel Division, American Brake Shoe Co., Chicago Heights, Ill.
Another Look at Sand Grain Distribution, B. H. Booth, Carpenter Bros. Inc., Milwaukee, and C. A. Sanders, American Colloid Co., Chicago
Fundamentals Make Better Castings, L. L. Clark, Armour Research Foundation, Chicago
Zircon Sands—Occurrence and Uses in Australian Industry, Paul Markwell, McLean Castings Ltd., Sydney, Australia. Official Exchange Paper from Institute of Australian Foundrymen, New South Wales Division. (Presented by R. W. Bennett, Walter Gerlinger Inc., Milwaukee)

2 p.m.—Heat Transfer Session
Presiding, H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland; vice chairman, F. T. McGuire, Deere & Co., Moline, Ill.
Solidification of Finite Cylinders, Heat Transfer Research Progress Report, V. Paschkis, Columbia University, New York
Heat Transfer Characteristics of Shell Molds, R. E. Morey, H. F. Bishop and W. S. Pellini, Naval Research Laboratory, Washington
Solidification of Various Metals in Sand and Chill Molds, F. A. Brandt, H. F. Bishop and W. S. Pellini, Naval Research Laboratory, Washington

2 p.m.—Refractories Session
Presiding, W. R. Jaeschke, Whiting Corp., Harvey, Ill.; vice chairman, R. A. Witschey, A. P. Green Fire Brick Co., Chicago
Economic Considerations in Refractory Ladle Practice, J. H. Rickey Jr., Ironton Fire Brick Co., Ironton, O.
Correlation of Air Furnace Bottom Temperature to Refractory and Operating Practice in a Cupola-Air Furnace Duplex System—Part II, F. W. Jacobs and E. C. Ashley, Texas Foundries Inc., Lufkin, Tex.

4 p.m.—Plant and Plant Equipment Session
Presiding, James Thomson, Continental Foundry & Machine Co., East Chicago, Ind.; vice chairman, H. W. Johnson, Wells Mfg. Co., Skokie, Ill.
Development of Cupola Melting Equipment, W. R. Jaeschke, Whiting Corp., Harvey, Ill.
Cupola Dust Collectors, D. E. Gilchrist, Deere & Co., Moline, Ill.

4 p.m.—Gray Iron Session
Presiding, V. A. Crosby, Climax Molybdenum Co., Detroit; vice chairman, W. C. Jeffery, University of Alabama, University, Ala.
Studies on the Machinability and Microstructure of Cast Irons, E. A. Loria, Carborundum Co., Niagara Falls, N. Y.
Machining Characteristics of Cast Irons, Michael Field and J. F. Kahles, Metcut Research Associates, Cincinnati
Fluidity vs. Core Blows in Automotive Gray Iron, A. A. Evans, International Harvester Co., Indianapolis

4 p.m.—Safety Session
(Sponsored by Safety, Hygiene and Air Pollution Control Committee)
Presiding, J. W. Young, International Harvester Co., Chicago; vice chairman, P. W. Olson, Foundry Division, Eaton Mfg. Co., Vassar, Mich.
Value of the Safety Program to the Foundry, E. C. Hoenicke, Foundry Division, Eaton Mfg. Co., Vassar, Mich.
The Camera Aids Our Housekeeping and Inspection Program, Harold Zuehlke, Allis-Chalmers Mfg. Co., Milwaukee
Training in Accident Prevention, T. A. Kraklow, Deere & Co., Moline, Ill.
Protective Equipment, R. L. Berger, Belle City Malleable Iron Co., Racine, Wis.
Engineering Safety into New Methods (film and narration), Verne Righter, Central Foundry Division, General Motors Corp., Danville, Ill.
What's the Big Problem in Your Safety Program? Roundtable Discussion

4 p.m.—Sand Session
Presiding, John Perkins, Ford Motor Co. of Canada Ltd., Windsor, Ont.; vice chairman, F. W. Jacobs, Texas Foundries Inc., Lufkin, Tex.

Casting Quality as Related to the pH Value of Molding Sands, G. J. Grott, Unitcast Corp., Toledo, O.
Food for Thought: What Is Basic to the Selection and Mulling of Synthetic Sands? C. E. Wenninger, National Engineering Co., Chicago
Pre-Mixing of Reconditioning Materials for Molding Sand, Burdette Jones, John Deere Waterloo Tractor works, Waterloo, Iowa

7 p.m.—Annual Banquet—Cleveland Public Auditorium
Presiding, Collins L. Carter, president, AFS
Presentation of AFS Gold Medal Awards and Honorary Life Memberships. Entertainment program.

THURSDAY, MAY 13

9 a.m.—Past Presidents' Breakfast

9:30 a.m.—Exhibits open

10 a.m.—Gray Iron Session
Presiding, F. T. McGuire, Deere & Co., Moline, Ill.; Vice chairman, R. A. Flinn Jr., University of Michigan, Ann Arbor, Mich.
Theoretical Aspects of Oxygen in Cast Iron, B. B. Bach, British Cast Iron Research Association, Birmingham, England. (Presented by H. W. Lownie Jr., Battelle Memorial Institute, Columbus, O.)
Some Variables in Acid Cupola Melting, S. F. Carter and Ralph Carlson, American Cast Iron Pipe Co., Birmingham
Melting of Cast Iron Borings and Steel Turnings in the Cupola, Exchange paper from Institute of British Foundrymen—William Y. Buchanan, John Lang & Sons Ltd., Johnstone, Renfrewshire, Scotland

10 a.m.—Sand Session
Presiding, C. E. Maddick, Massey-Harris Co., Brantford, Ont.; vice chairman, C. W. Schwenn, Brillion Iron Works Inc., Brillion, Wis.
Recent Developments in Shell Molding, E. I. Valyi, A.R.D. Corp., Yonkers, N. Y.
Pressure Molding with Standard Synthetic Sands, T. E. Barlow and W. R. Adams, Eastern Clay Products Department, International Minerals & Chemical Corp., Chicago
Research on Shell Molding, R. G. Powell, C. M. Adams Jr., and H. F. Taylor, Massachusetts Institute of Technology, Cambridge, Mass.

10 a.m.—Steel Session
Presiding, J. R. Patton, General Steel Casting Corp., Granite City, Ill.; vice chairman, J. H. Janssen, Pratt & Letchworth Division of Dayton Malleable Iron Co., Buffalo
Effect of Pouring Temperature on the Soundness and Physical Properties of Steel Castings, C. F. Christopher, Continental Foundry & Machine Co., East Chicago, Ind.
Why Did It Fail? M. V. Herasimchuk, Bethlehem Steel Co., Bethlehem, Pa.

10 a.m.—Heat Transfer Session
Presiding, E. C. Troy, Engineer, Palmyra, N. J.; vice chairman, J. B. Caine, consultant, Cincinnati
Heat Transfer of Various Molding Material for Steel Castings, Charles Locke, West Michigan Steel Castings Co., Muskegon, Mich., and C. W. Briggs, Steel Founders' Society of America, Cleveland
Studies of Chill Action, E. T. Myskowski, H. F. Bishop and W. S. Pellini, Naval Research Laboratory, Washigton

12 noon—Steel Roundtable Luncheon
Presiding, V. E. Zang, Unitcast Corp., Toledo, O.

2 to 5 p.m.—Air Pollution Control Session
Presiding, F. A. Patty, General Motors Corp., Detroit; vice chairman, K. M. Smith, Caterpillar Tractor Co., Peoria, Ill.
Experiences with the Use of Spray Type Collector on a 72-in. Cupola, A. G. Tompkins, Lufkin Foundry & Machine Co., Lufkin, Tex.
Cupola Fly-Ash Suppression, R. M. Ovestrud, Minneapolis-Moline Co., Minneapolis
Cupola Emission Control, Otto Brechtelsbauer, Chevrolet-Saginaw Gray Iron Foundry Division, General Motors Corp., Saginaw, Mich.
Control of Emissions from the Electric Furnace, L. Krueger, Pelton Steel Casting Co., Milwaukee
Control of Emissions from Metal Melting Operations—Roundtable Discussion

2 p.m.—Refractories Shop Course
Presiding, R. H. Stone, Vesuvius Crucible Co., Pittsburgh; vice chairman, W. R. Jaeschke, Whiting Corp., Harvey, Ill.
Importance of Refractories in Your Foundry. Panel Members: Ralph Carlson, American Cast Iron Pipe Co., Birmingham; C. L. Norton, Babcock & Wilcox Co., New York; R. H. Stone, Vesuvius Crucible Co., Pittsburgh; A. H. Thompson, Canadian Refractories Ltd., Montreal; R. A. Witschey, A. P. Green Fire Brick Co., Chicago

2 p.m.—Cost Session
Presiding, R. L. Lee, Grede Foundries Inc., Milwaukee; vice chairman, George Tisdale, Zenith Foundry Co., Milwaukee
Question and Answer Panel—Panel members: A. C. Sinnett, Terre Haute Malleable & Mfg. Corp., Terre Haute, Ind.; C. R. Culling, Carondelet Foundry Co., St. Louis; C. E. McQuiston, Advance Foundry Co., Dayton, O.; D. F. Palmer, U. S. Pipe & Foundry Co., Burlington, N. J.; N. J. Schmidt, Gunite Foundries Corp., Rockford, Ill.; J. A. Wagner, Wagner Malleable Iron Co., Decatur, Ill.; C. E. Westover, Westover Engineers, Milwaukee.

2 p.m.—Gray Iron Session
Presiding, R. A. Clark, Electro Metallurgical Co., Detroit; vice chairman, C. K. Donoho, American Cast Iron Pipe Co., Birmingham
Australian Methods of Producing Special Pipes—Exchange paper from Institute of British Foundrymen, Victoria Branch—G. J. Benson, Melbourne Technical College, Melbourne, Australia.
Importance of Cooling Rate on Physical Properties of Gray Cast Irons, Jules Henry, Forest City Foundries Co., Cleveland
Risering of Semi-Circular Plate Castings, R. C. Shnay and S. L. Gertsman, Department of Mines & Technical Surveys, Ottawa, Ont.

2 p.m.—Sand Session
Presiding, C. F. Walton, Gray Iron Founders' Society, Cleveland; vice chairman, W. D. Lawther, American Steel Foundries, East St. Louis, Ill.
Core Blowing Problems, J. A. Mescher, Unitcast Corp., Toledo, O.
What Is Stickiness in Core Sand Mixtures? W. H. Buel, Aristo Corp., Detroit
Olivine-Silica Molding Sands, G. S. Schaller and W. A. Snyder, University of Washington, Seattle

4 p.m.—Sand Session
Presiding, James H. Lansing, Malleable Founders' Society, Cleveland; vice chairman, C. F. Quest, J. F. Quest Foundry Co., Minneapolis
A Method of Establishing Standards for As-Cast Surfaces, Roy Loder, Erie Malleable Iron Co., Erie, Pa.
Improving Surface Finish on Gray Iron Castings, W. G. Parker, General Electric Co., Elmira, N. Y.
Statistical Analysis of Factors Affecting Casting Finish, D. C. Ekey and J. E. Goldress, Pennsylvania State University, State College, Pa.

4 p.m.—Gray Iron Session
Presiding, H. W. Lownie Jr., Battelle Memorial Institute, Columbus, O., vice chairman, G. Vennerholm, Ford Motor Co., Dearborn Mich.

Risering of Gray Iron Castings—Gray Iron Research Progress Report No. 5— W. Schmidt, E. Sullivan and H. F. Taylor, Massachusetts Institute of Technology, Cambridge, Mass.

Calcium Carbide Injection—A New Metallurgical Tool for the Foundryman, J. M. Crockett, Air Reduction Sales Co., New York; and H. E. Henderson, Lynchburg Foundry Co., Lynchburg, Va.

Alloying and Heat Treating Spherulitic Graphite Cast Iron, C. C. Reynolds and H. F. Taylor, Massachusetts Institute of Technology, Cambridge, Mass.

6:30 p.m.—AFS Alumni Dinner (invitational)

8 p.m.—Gray Iron Shop Course

Presiding, W. W. Levi, Lynchburg Foundry Co., Radford, Va.; vice chairman, W. W. Holden, Foundry Division, Eaton Mfg. Co., Vassar, Mich.

Cupola Bed Practice—Discussion Leader, D. E. Mathieu, Alabama Pipe Co., Anniston, Ala.

8 p.m.—Sand Shop Course

Presiding, O. J. Myers, Archer-Daniels-Midland Co., Minneapolis; vice chairman, H. W. Schutzenhofer, Key Co., East St. Louis, Ill.

Fundamentals of Sand Control—Moderator, C. A. Sanders, American Colloid Co., Chicago. Panel members: C. H. Wyman, Burnside Steel Foundry Co., Chicago; E. C. Troy, Engineer, Palmyra, N. J.

FRIDAY, MAY 14

9:30 a.m.—Ehibits open

10 a.m.—Gray Iron Session

Presiding, A. E. Schuh, U. S. Pipe & Foundry Co., Burlington, N. J.; vice chairman, T. W. Curry, Lynchburg Foundry Co., Lynchburg, Va.

Effect of Graphite Flake Size upon the Tensile and Fatigue Properties of Gray Cast Iron, R. W. Lindsay, Pennsylvania State University, State College, Pa.; and J. H. Hoke, Johns Hopkins University, Baltimore

Relationship of the Carbon Equivalent to the Properties of Cast Iron, W. C. Jeffery, E. E. Langner Jr., W. G. Mitchell and G. D. Azizi, University of Alabama, University, Ala.

Graphitization of Certain Fe-C-Ti Alloys, A. B. Beach and R. W. Heine, University of Wisconsin, Madison, Wis. (Presented by P. C. Rosenthal, University of Wisconsin)

10 a.m.—Sand Session

Presiding, C. C. Sigerfoos, Michigan State College, East Lansing, Mich.; vice chairman, D. C. Williams, Ohio State University, Columbus, O.

Investigation of Steel Foundry Sands at Elevated Temperatures—Sand Research Project, 13th Progress Report—R. G. Thorpe, O. P. Eberlein, R. C. Waugh and P. E. Kyle, Cornell University, Ithaca, N. Y.

Effect of Moisture Content on Silica Sand, Ed Sayre, Aircraft Gas Turbine Division, General Electric Co., Cincinnati, and C. T. Marek, Purdue University, Lafayette, Ind.

Metal Penetration Tests on Dry Sand Cores and Core Washes—Progress Report of Mold Surface Committee 8-H—C. C. Sigerfoos, chairman, Michigan State College, East Lansing, Mich.

10 a.m.—Steel Session

Presiding, B. C. Yearley, National Malleable & Steel Castings Co., Cleveland; vice chairman, R. A. Willey, Commercial Steel Casting Co., Marion, O.

Factors Which Determine Riser Adequacy Feeding Range, W. S. Pellini, Naval Research Laboratory, Washington

Design and Operation of a Modern Heat Treating Department, R. W. Wilson, American Hoist & Derrick Co., St. Paul

1 p.m.—Exhibits close

FOUNDRY SHOW

To Be Largest in History

THE 1954 Foundry Show, to be staged in Cleveland's Public Auditorium, May 8-14, during the 58th annual convention of the American Foundrymen's Society, is expected to be the largest in history. Its approximately 300 separate displays will include a wide variety of machines, equipment, materials, supplies and services.

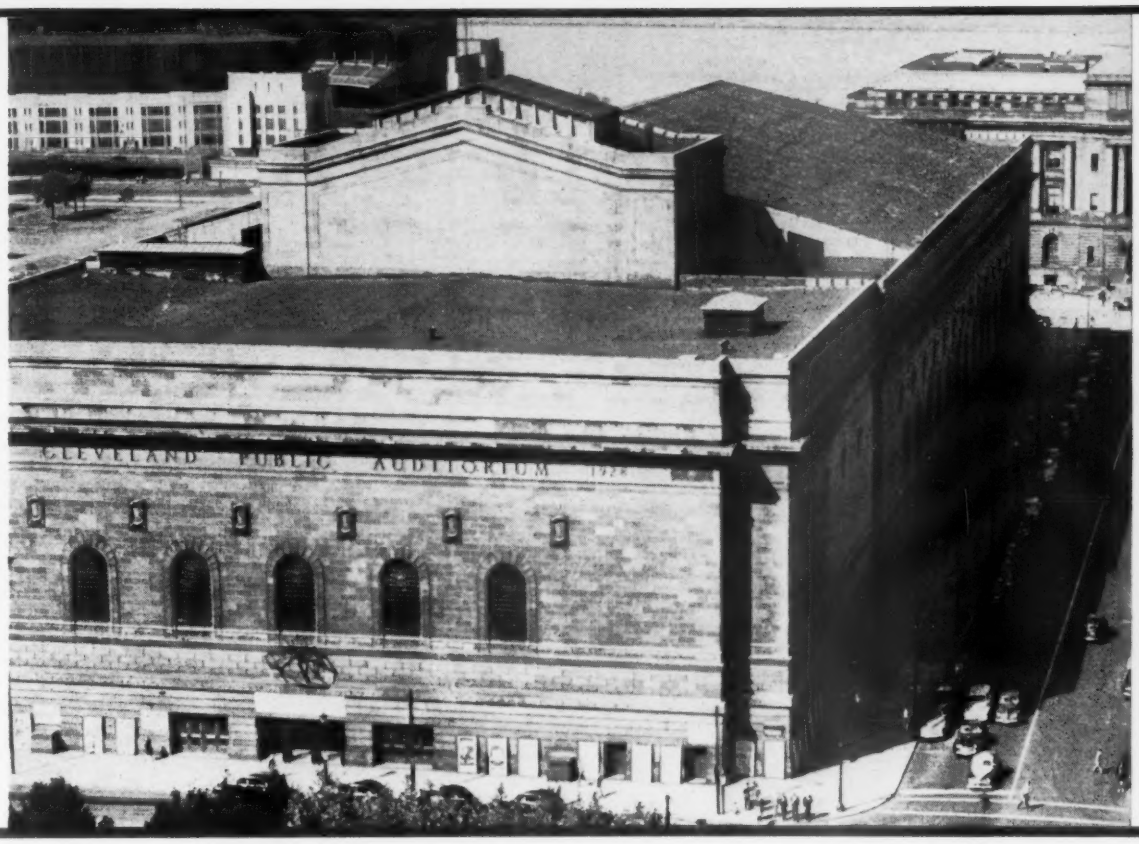
Many exhibitors will show equipment in use or will display operating models. A number of working exhibits are planned by suppliers of machines and materials for the shell molding process. Developments in automatic controls, improvements in existing machines, and new equipment to be shown for the first time will attract particular interest. Numerous exhibitors will display equipment especially adapted to the small foundry.

Show hours will be 9:30 a.m. to 5:30 p.m. on all days except Wednesday—12 noon to 5:30 p.m.—and Friday—9:30 a.m. to 1 p.m. The show will be closed on Sunday. Saturday, May 8, the opening day, will be Northeastern Ohio Day when all foundry employees of the area will be admitted by free tickets available through the local AFS chapter. John Davenport, Fulton Foundry & Machine Co., Cleveland 27, is chairman of the Northeastern Ohio Day Committee.

LIST OF EXHIBITORS

(Corrected to Apr. 12)

	Booth No.
Acme Resin Corp., Forest Park, Ill.	1334
Adams Co., Dubuque, Iowa	1208
Aerodyne Development Corp., Cleveland	704-805
A. I. C. Engineering Co., Indianapolis	1706
Air Reduction Sales Co., New York	328
Ajax Electrothermic Corp., Trenton, N. J.	902-04
Ajax Electric Furnace Corp., Trenton, N. J.	902-04
Ajax Flexible Coupling Co., Westfield, N. Y.	1612
Ajax Metal Division, H. Kramer & Co., Philadelphia	1702
Allis-Chalmers Mfg. Co., Milwaukee	1116-18, 1209-15
Alloy Metal Abrasive Co., Ann Arbor, Mich.	108
Alpha-Lux Co. Inc., New York	209
American Air Filter Co. Inc., Louisville	1219
American Alloys Corp., Kansas City, Mo.	101
American Colloid Co., Chicago	324-26
American Conveyor Co., Chicago	1509
American Fire Clay & Products Co., Canfield, O.	507
American Foundryman, Chicago	1426
American Gas Association, New York	418-20
American Metal Market Co., New York	218
American Refractories & Crucible Corp., North Haven, Conn.	112
American Silica Sand Co.; Ottawa, Ill.	417
American Steel Abrasives Co., Galion, O.	610-12
American Tank & Fabricating Co., Cleveland	1407
American Wheelabrator & Equip. Corp., Mishawaka, Ind.	1435-44
Apex Smelting Co., Chicago	201
Archer-Daniels-Midland Co., Cleveland	504, 602
Arrow Pattern & Engineering Co., Erie, Pa.	1015
Austin-Western Co., Aurora, Ill.	1915
Automatic Foundry Equipment (Reichert Inc.) Newark, N. J.	1429
Ayers Mineral Co., Zanesville, O.,	501
Baird Associates, Cambridge, Mass.	404
Bakelite Co., Division of Union Carbide & Carbon Corp., New York	901-03
Baker-Lull Corp., Minneapolis	1336
Baroid Sales Division, National Lead Co., Chicago	126
Barrett Division, Allied Chemical & Dye Corp., Toledo	1909
C. O. Bartlett & Snow Co., Cleveland	1514
Bay State Abrasive Products Co., Westboro, Mass.	1339-41
Beardsley & Piper Division, Pettibone Mulliken Corp., Chicago	1218-26, 1327-33
Bedford Tool & Forge Co., Bedford, O.	1603
Beryllium Corp., Reading, Pa.	1810
Black, Sivalls & Bryson Inc., Kansas City, Mo.	107
Blastcrete Service Co., Los Angeles	124
Blaw-Knox Co., Pittsburgh	1004
Bohn Aluminum & Brass Corp., Detroit	312
Borden Co., Chemical Division, New York	509-11-13
British Moulding Machine Co. Ltd., Faversham, Kent, England	1428
Brush Beryllium Co., Cleveland	304
Buckeye Products Co., Cincinnati	318
Buda Co., Harvey, Ill.	1712-14
Burr Oak Brass & Aluminum Division, Keyes-Davis Co., Burr Oak, Mich.	407
Burgess-Sterbentz Corp., Cleveland	1625
Cambria Foundry & Engineering Division, Stevens Mfg. Co., Ebensburg, Pa.	1522
Campbell-Hausfeld Co., Harrison, O.	1011
Canton Chaplet & Mfg. Co., Canton, O.	2002
Carl-Mayer Corp., Cleveland	1807
Centrifugal Casting Machine Co., Tulsa, Okla.	806
Chain Belt Co., Milwaukee	1225
Chicago Blower Corp., Franklin Park, Ill.	1503
Chicago Pneumatic Tool Co., New York	1617



1954 AFS CONVENTION

Clark Equipment Co., Industrial Truck Division, Battle Creek, Mich. 1524-1627
Clayton Sherman Abrasives Co., Detroit 610-12
Clearfield Machine Co., Clearfield, Pa. 1526
Cleco Division, Reed Roller Bit Co., Houston, Tex. 807-09
Cleveland Flux Co., Cleveland 125
Cleveland Metal Abrasive Co., Cleveland 1006
Cleveland Quarries Co., Amherst, O. 1811-13
Cleveland Vibrator Co., Cleveland 1343
Climax Molybdenum Co., New York 1911-13
Clino Foundry Supplies Ltd., London, England 100
Colonial Metals Co., Columbia, Pa. 406
Cone-Drive Gears, Division of Michigan Tool Co., Detroit 1608
Corn Products Sales Co., New York 411

Dant & Russell Inc., Portland, Oreg. 2008
Davenport Machine & Foundry Co., Davenport, Iowa 1520
Dayton Oil Co., Dayton, O. 705
Dayton Pneumatic Tool Co., Dayton, O. 1229
Debevoise-Anderson Co. Inc., New York 910
Delhi Foundry Sand Co., Cincinnati 301
Delta Oil Products Co., Milwaukee 1904-06
Wm. Demmler & Bros., Kewanee, Ill. 1206
Detroit Electric Furnace Division, Kuhlman Electric Co., Bay City, Mich. 1126
Harry W. Dietert Co., Detroit 427
Dings Magnetic Separator Co., Milwaukee 216
Joseph Dixon Crucible Co., Jersey City, N. J. 227
DoAll Co., Des Plaines, Ill. 1003
Dougherty Lumber Co., Cleveland 221
Dow Corning Corp., Midland, Mich. 608
Dravo Corp., Pittsburgh 2004-06
Durez Plastics & Chemicals Inc., North Tonawanda, N. Y. 1130
Eastern Clay Products Department, International Minerals & Chemical Corp., Chicago 1507
Eastman Kodak Co., Rochester, N. Y. 1910
Eimco Corp., Chicago 1436
Electric Controller & Mfg. Co., Cleveland 1604
Electro Metallurgical Co., Division of Union Carbide & Carbon Corp., New York 905-11
Electro Refractories & Abrasives Corp., Buffalo 1228
Euclid Foundry & Machine Equipment Co., Cleveland 1718
Exomet Inc., Conneaut, O. 1701

Fabreeka Products Co., Boston 1234
Fanner Mfg. Co., Cleveland 1105
Federal Foundry Supply Co., Cleveland 1012-1111
Federated Metals Division, American Smelting & Refining Co., New York 302
Foundry Educational Foundation, Cleveland 309
Foundry Equipment Co., Cleveland 1626
Foundry Equipment Manufacturers Association, Cleveland 1429
Foundry Facings Manufacturers Association, Pittsburgh 409
FOUNDRY, Cleveland 1119
Foundry Services Inc., New York 1102
Fox Grinders Inc., Pittsburgh 1502
Freeman Supply Co., Toledo, O. 1022-24
Fremont Flask Co., Fremont, O. 710

Gamma Industries Inc., Baton Rouge, La. 104
General Blower Co., Morton Grove, Ill. 1535
General Electric Co., Chemical Division, Pittsfield, Mass. 1518-1621
Gerwin Industries Inc., Michigan City, Ind. 1533
Girdler Corp., Louisville 1236, 1347-49
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AFS Selects Six Men for GOLD MEDALS

WALTER E. SICHA

William H. McFadden Medalist

Walter E. Sicha, chief of the Cleveland Research Division, Aluminum Co. of America, is to be honored as recipient of the William H. McFadden Gold Medal "for his extensive and valuable work on light metals casting alloys." A Case Institute of Technology graduate and holder of a master's degree from the University of Michigan, Mr. Sicha has been with the Aluminum Co. of America since 1929. He was appointed to his present position in 1950. He is a past president of the society's Northeastern Ohio Chapter and chairman of the AFS Light Metals Division's Research Committee.

THOMAS E. EAGAN

Joseph S. Seaman Medalist

Thomas E. Eagan will receive the Joseph S. Seaman Gold Medal "for his outstanding work in the development and dissemination of engineering data on production and utilization of alloy cast irons." Research metallurgist with Cooper-Bessemer Corp., Grove City, Pa., Mr. Eagan has been associated with the company since 1934. His education includes degrees from Columbia University, New York, and Missouri School of Mines and Metallurgy, Rolla, Mo. Mr. Eagan has been active in several technical societies in the metalworking field and was on the AFS board of directors 1949-1952.

ROY A. GEZELIUS

Peter L. Simpson Medalist

Roy A. Gezelius has been named recipient of the Peter L. Simpson Gold Medal in recognition of his "outstanding contributions to the steel casting industry, particularly with reference to the development and production of cast armor plate." Mr. Gezelius, a graduate of Michigan State College, is chief metallurgist and assistant works manager, General Steel Castings Co., Eddystone, Pa. Previously he was with the Naval Research Laboratory, Washington, and later with Taylor-Wharton Iron & Steel Co., High Bridge, N. J. During the war Mr. Gezelius was chairman of the Cast Armor Committee, Army Ordnance.

and LIFE MEMBERSHIPS

LEROY P. ROBINSON

Leroy P. Robinson, vice president, Archer-Daniels-Midland Co., Cleveland, will receive a life membership in AFS in recognition "of his outstanding and long-sustained service to the society and its chapters, and for singular contributions to the improvement of foundry coreroom practice." A native of Iowa, Mr. Robinson attended Lombard College. Since 1917, when he entered the core oil industry, he has given innumerable talks before various foundry groups throughout the country. Mr. Robinson is a former president of Northeastern Ohio Chapter, which he helped organize, and a past national director of AFS.

EARL M. STRICK

Earl M. Strick, finishing superintendent, Erie Malleable Iron Co., Erie, Pa., will be awarded an honorary life membership "for his outstanding work in the development and encouragement of foundry interest at the high school and trade school level through the medium of local chapters." A veteran with 43 years of service in the foundry industry, Mr. Strick was one of the organizers of the Northwestern Pennsylvania Chapter of AFS, of which he is a past chairman and past secretary. Through numerous talks before various public groups, and by means of booklets, newspaper advertisements and a film slide he was instrumental in developing, Mr. Strick has been particularly active in encouraging young people to enter the foundry industry.

COLLINS L. CARTER

Collins L. Carter, as retiring president of the American Foundrymen's Society, will be awarded an honorary life membership upon completion of his term. Mr. Carter is president of the Albion Malleable Iron Co., Albion, Mich., having been associated with that organization since graduation from Cornell University in 1929. In addition to his service to the AFS, Mr. Carter has served as president of the Malleable Founders' Society and as president of the National Castings Council.

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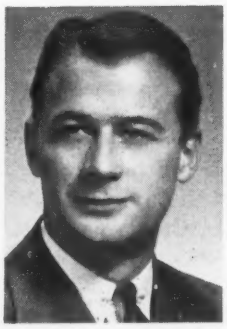

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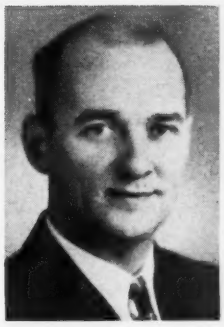

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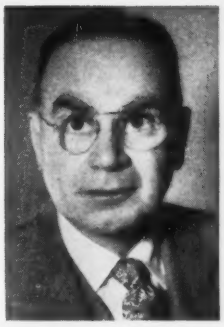

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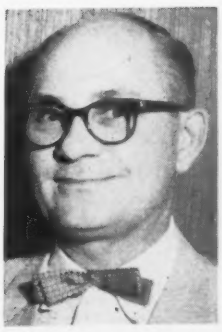

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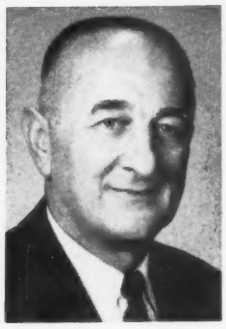

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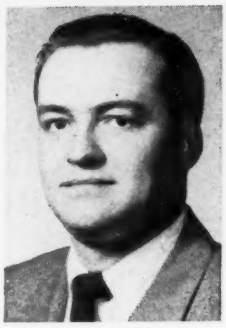

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Werner G. Smith Inc.
ARTHUR J. HARLAN
Hickman, Williams & Co.

ROBERT H. HERRMANN

MRS. DAVID CLARK JR.

JAMES G. GOLDIE

PLANT VISITATIONS

SEVERAL foundries and pattern shops, including the new, highly mechanized foundry of Ford Motor Co. shown above, will be open to visitors during the AFS convention and show in Cleveland. Dates and hours during which the various plants will be open are listed in the accompanying table. With the exception of the Ford foundry, all may be reached by municipal bus lines. Buses are being chartered for the Ford visitation on Friday. The cost will be about $1 round trip and registration for the visit must be made by 10 a.m. Thursday.

Emil J. Romans, National Malleable & Steel Castings Co., executive secretary of the Northeastern Ohio Chapter Plant Visitation Committee, with the help of committee members will be in charge of the booth at Public Auditorium to handle registration and provide bus schedules for visitors.

PLANT	FEATURES	AVAILABILITY
ALLYNE-RYAN FOUNDRY CO. Aetna Rd. & East 91st St.	Gray iron, semimechanized shop. Cylinders, automotive castings, diesel engines	May 12 9 a.m. to noon
ARROW ALUMINUM CASTINGS CORP. 3135 Berea Rd.	Semimechanized shop. Sand and permanent mold aluminum castings	May 10 1 to 4:30 p.m
CRUCIBLE STEEL CASTING CO. 8401 Almira Ave.	Steel castings, semimechanized shop. Pneumatic sand reclamation system	May 13 9 a.m. to noon
FORD CLEVELAND FOUNDRY Engle Rd. near Brookpark Rd.	Highly mechanized automotive shop	May 14 9 a.m. to noon 1 to 4 p.m.
FOREST CITY FOUNDRIES CO. (Plant B) Maywood Ave. & West 94th St.	Gray iron, semimechanized shop. Castings from 5 to 150 lb	May 12 10 a.m. to noon
FULTON FOUNDRY & MACHINE CO. Morgan Ave. & East 75th St.	Gray iron, semimechanized jobbing foundry and machine shop	May 10 to 14 9 a.m. to noon
GLUNTZ BRASS & ALUMINUM FOUNDRY CO. 10805 Harvard Ave.	Brass, bronze and aluminum castings. Pattern shop	May 10 to 11 Noon to 3 p.m.
MASTER PATTERN CO. 1315 Main Ave.	Modern pattern shop. Permanent mold castings	May 13 9 a.m. to noon
MEECH FOUNDRY CO. 9914 Meech Ave.	Gray iron, mechanized shop. Sand conditioning and molding unit	May 11 9 a.m. to noon
MOTOR PATTERNS CO. 3035 East 61st St.	Completely equipped pattern shop	May 12 9 a.m. to noon
NATIONAL MALLEABLE & STEEL CSTGS. CO. 10600 Quincy Ave. S. E.	Malleable iron, mechanized. Electric heat treating of pearlitic malleable	May 11 9 to 11:30 a.m.
NATIONAL MALLEABLE & STEEL CSTGS. CO. Technical Center—2570 Woodhill Rd.	New and modern physical testing laboratory. Centralized technical organization	May 11 1 to 4:30 p.m.
STANDARD ALLOY CO. 1679 Collamer Ave.	Specialty custom shop. High nickel chrome alloy, heating and corrosion applications	May 10 1 to 3:30 p.m.
SUPERIOR FOUNDRY INC. 3542 East 71st St.	Gray iron, mechanized and semimechanized shop	May 11 9 a.m. to noon
WEST STEEL CASTING CO. 805 East 70th St.	Steel castings, laboratory, pattern shop, machine shop	May 13 9 a.m. to noon

How to

MODERNIZE YOUR FOUNDRY

The author explains how judicious spending to keep our plants modern and to permit the worker to produce the most for his efforts can increase quality, production, wages and profits

FOR THE past ten years much has been written, talked and advertised about foundry modernization. Reduced to its simplest terms, foundry modernization is the application and successful use of the organization, methods, procedures, facilities and controls that permit maximum production with minimum man-hours and minimum materials consumption and results in an adequate return to labor, management and owners.

The equipment manufacturers have emphasized the term "foundry mechanization" to such a degree that I think it is fair to state that most foundrymen think of it in terms of equipment and mechanization. Of course, every modernization program requires that degree of mechanization or motorization that is economically justified for the mission of the particular foundry.

Today, with the competition of other methods of manufacture, increasingly higher wages and a more competitive market, even those foundries which are highly mechanized are faced with the problem of what they should do to reduce costs and maintain an adequate profit.

Are existing mechanized foundries obsolete? Should an operation which is semi-mechanized be fully mechanized? Can the principles of mass production operation be applied to a jobbing or production-jobbing requirement? How much money should be spent for mechanization? How fast should the project be amortized on the basis of reduction in material and labor costs made possible by the proposed investment? The foregoing are a few of the questions foundry management and owners are faced with in deciding on an improvement program for plant and equipment.

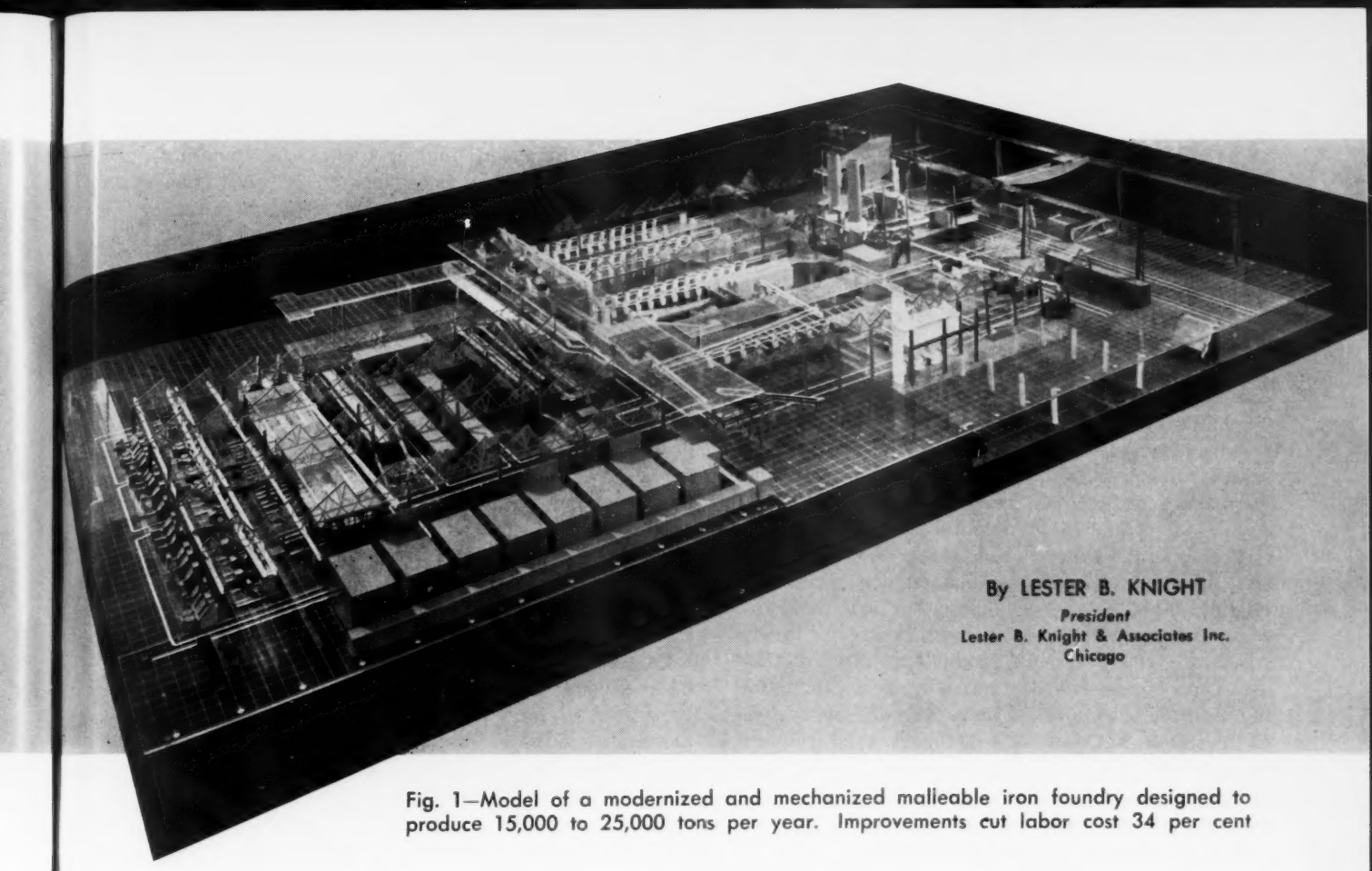
Different Types of Foundries—There are single-purpose foundries where only one casting is produced, such as aluminum cylinder heads for aircraft or tank engines. There are, also, production foundries for large numbers of pieces of similar classes of castings, such as automotive, farm implement, sanitary ware, valves, fittings, etc. These make up a substantial part of the tonnage of our industry, although the total number of plants is relatively small—perhaps 300 to 350.

The next important segment of our foundry industry is the production-jobbing type of foundry. There are perhaps 1200 foundries in this category and they represent a substantial portion of our casting tonnage.

The jobbing foundry is the most numerous, although that type of foundry (approximately 3500) does not represent as large a tonnage or employment as the production and production-jobbing type of foundry.

The problem of foundry modernization is complex, at best, because there are virtually no two foundries whose problems are identical, and there is always more than one way to rig to produce a given casting successfully and economically. This problem is further complicated by the special requirements of the different metals—iron, steel, malleable, nonferrous and myriad alloys thereof.

More recently the complications of shell molding and pressure molding, are added to the problems of green or dry sand, permanent molds, die casting, assembled cores, plaster and other types of investment casting.



By LESTER B. KNIGHT
President
Lester B. Knight & Associates Inc.
Chicago

Fig. 1—Model of a modernized and mechanized malleable iron foundry designed to produce 15,000 to 25,000 tons per year. Improvements cut labor cost 34 per cent

The human element, of course, varies with every plant and is of equal if not greater importance than the physical facilities.

What Is Required—Therefore, when the problem is to determine a program of modernization and mechanization for a particular foundry, it is fundamental to a successful program that the current and preceding operations be analyzed to determine the strengths and weaknesses of the operation.

This involves, first, a study of organization to make certain that the necessary functions are included and have a proper workable relationship, each with the other. Staff and line functions should be clearly defined with proper responsibility and commensurate authority to do the job. Then, the necessary control information should be provided so that each can be held accountable for performance. It is not uncommon to find an "organization chart," but also to find that the plant is not being operated in accord with the chart and usually with less efficiency and more work than would be required with an orderly procedure.

It is important to analyze order handling and production scheduling and control, because any plant can be more or less efficient by the manner in which it is scheduled.

It is most important that standards and other information furnished to and used by estimating be checked to make certain that the sales department is given the proper information with which to do a selective sales engineering type of job to insure a profitable operation.

Standard data developed by time study and then further applied by the use of synthetic standards to minimize time study may be used for estimating, scheduling, cost control, incentive wage payment plans and budgeting.

A study of the rigging of the jobs—pattern, corebox, flask and method of production—must be made to determine what changes, if any, are warranted. Standardization of flask sizes can save substantial handling and other costs.

Study All Departments—A study of all departments from receipt of raw material to shipment of finished castings from the foundry should be made to analyze methods used, number of people, unit production, lost time, scrap, overtime, down time, materials consumption and rates of pay, from which it is possible to determine the strong and weak points of the operation. Comparison, insofar as practicable, with low-cost, similar foundries also is desirable.

After such a comprehensive study, the proposed future mission of the foundry should be defined as clearly as possible. It is important that the foundry be operating profitably with what it has, before making substantial additional capital investments. Usually, "poor" management does not become good management with additional equipment. Actually, a mechanized foundry is more difficult to manage than the manual type foundry, because it requires more pre-planning. Lost time in the mechanized operation is far more expensive, and the opportunities for lost time are far more numerous. These include lack of sand, lack of metal, lack of storage space, no cores, cores not fitting, mold tearing, flask pins sticking, mechanical or electrical shutdown, to mention a few. At best,

the mechanized shop will produce an average of approximately 85 per cent of the available time, and this must always be taken into consideration in design, in estimating, etc.

In some instances, management merely is interested in increasing efficiency on the present work, with virtually present facilities and minimum capital expenditures. Other projects involve provision for substantial increase in production with minimum expense for "brick and mortar." Still other projects involve a complete new plant.

Seldom is the problem to provide for a lesser total production, although if the modern plant is properly designed for the work to be produced, it usually has sufficient flexibility for a profitable operation through a greater variation in total production than does the manual shop.

Decide on Rigging Method—After the future mission of the foundry is established, the method of rigging should be agreed upon that will require a minimum number of flask sizes and pattern changes to obtain the proposed production. The method and type of machine for mold or core production must be decided and, if there are different kinds of metal or substantially different sand requirements, cooling times or shakeout conditions, then these must be provided or allowed for.

It is important, if we are to have a modern operation, that the techniques of mass production and progressive operation be applied to provide minimum interference with "ability to produce" and to require a minimum of handling. In general, nothing should be handled unless an operation is performed, and with careful planning and occasional rearrangement, as classes of work change, this principle can be obtained to a high degree. Without it, there is always a higher cost of operation than should be possible by proper application of the principle.

Another general "rule" is to rig to obtain the maximum yield per mold and per casting. The conversion cost as well as the melting loss, because of relatively high labor and material costs, is more important today, and every effort should be made to secure the highest yield.

With high speed and/or automatic molding methods, composite patterns may be and must be used to minimize pattern changes and permit use of larger mold sizes that will allow larger weight of metal per mold. This reduces the total number of molds required for a production, simplifies the pouring problem and requires fewer pourers. As product mix changes, it may be necessary to have some smaller special pattern plates to meet sales requirements. In other words, design to accommodate the major portion of the production and then establish facilities to take care of the "miscellaneous" items and peak requirements beyond normal.

Many studies indicate that 75 to 90 per cent of production is obtained from 20 to 30 per cent of the number of patterns.

It is usually the profitable foundries that continue to strive to increase unit production and take advantage of technological developments. A detailed analysis in such foundries has indicated very substantial further cost reductions may be accomplished with capital expenditures that are equivalent to three-years' (or less) reduction in labor and materials costs.

Over a period of time, class of work changes and facilities may not be entirely suitable for the work to be made. New developments, higher wages and materials costs obsolete existing methods and facilities. This highlights, again, the desirability of a periodic check and the need to analyze each department to determine what self-amortizing changes are desirable in charge make-up, charging, melting, molding, coremaking, baking, finishing and handling, mold handling, pouring, shakeout, casting handling, cleaning and finishing.

The ultimate goal is to produce a finished casting, to do a job, at the lowest over-all cost as a finished part, not only to compete with other foundries but with other methods of fabrication, such as forging, stamping or welding.

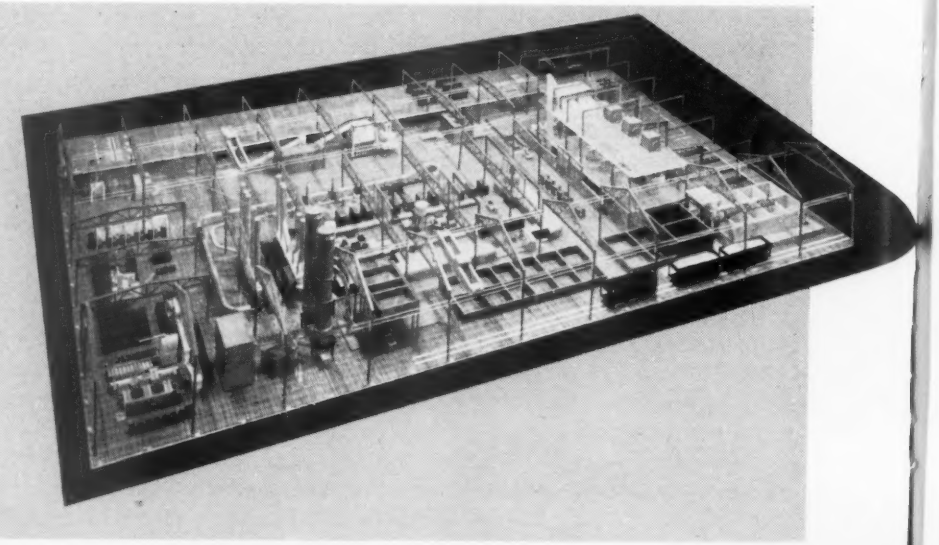


Fig. 2—This shows the arrangement of equipment in a new jobbing foundry designed for production of engine and centrifugal pump castings of gray iron

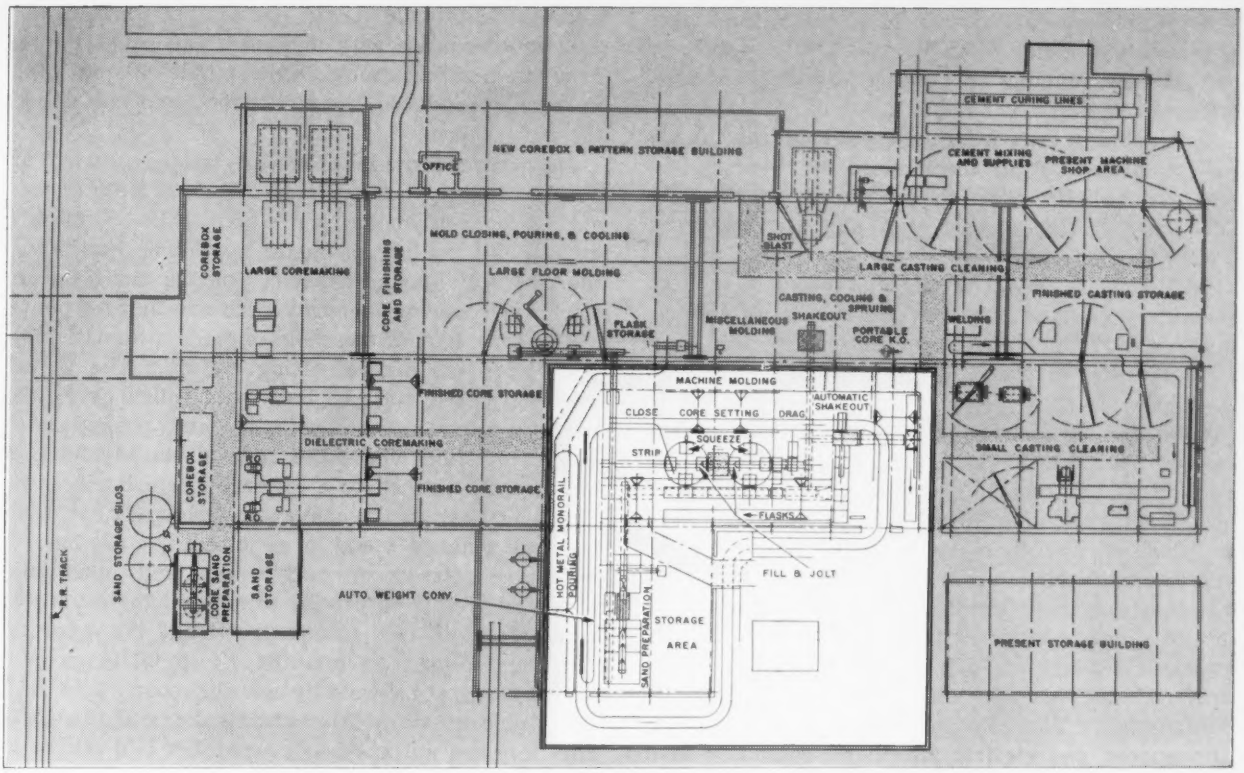


Fig. 3—Layout for a specialty shop to produce approximately 20 tons a day of cast iron fittings. The unit has good flexibility for this type of work

Prepare a Layout—When the mission of the foundry is established and the rigging agreed upon, it is not too difficult to lay out, schematically, the proposed equipment in each department. A study of the individual operations must be made to make certain a balanced operation is established. Periodic changes in demand may require added personnel, equipment, or longer hours in one or more departments, but for the basic mission of the foundry, a balanced operation should be established.

With today's relatively high equipment and construction costs, it is conservative and desirable to minimize investment by planning for multiple-shift operation.

In planning the layout, it is of prime importance to minimize handling and to eliminate the need for indirect labor. In the past much of the emphasis has been placed on reducing molding and coremaking costs and not enough on reducing service and cleaning labor costs.

When the layout has been agreed upon, the proposed manning to accomplish the mission should be established. When it is compared with actual current labor costs, the difference in cost may be established readily.

Since the foundry is largely a problem or series of problems of process control and materials handling—approximately 100 to 400 tons of material is handled to produce 1 ton of castings—it is important that material consumption be reduced to a minimum. Every pound of material brought into the plant must be taken out of the plant, and refuse disposal can be and is a substantial problem.

Sand reclamation has developed favorably, and many plants reclaim 80 to 90 per cent of the sand formerly carted to the dump.

An estimate of cost of the proposed facilities may be made from the schematic layout. An estimate of cost of operation under the proposed conditions may be made and, by comparison with present costs, the time required to recapture the cost may be determined.

With these facts, any reasonable management can make a sound decision. The cost of obtaining such a comprehensive plan and all the facts usually is less than 2 per cent of the cost of the project. Such a small amount can be, and many times is lost several times over, by inadequate planning, or a "piecemeal" approach without an over-all plan for long-range development.

Many times, the foundry cannot proceed with the entire modernization program, because of cost, interference with production, time required to make the changes, etc. Then, a step-by-step program may be established to meet local conditions, but all money will be spent toward an ultimate, balanced, modern, low-cost plant. There are many foundries that have spent enough money to have a modern plant, but because of inadequate planning still have a high-cost operation.

What Can Be Done—A brief review of a few recent projects which reflect what can be accomplished in an existing plant and in a new plant is as follows:

1. A highly mechanized plant to produce malleable iron fittings up to 2-in. diameter—total production approximately 15,000 to 25,000 tons per

year. (This operation was in a mechanized but obsolescent foundry.)

2. A new foundry to produce castings for centrifugal pumps.

3. A jobbing gray iron and malleable iron foundry—motorized but not mechanized.

4. A specialty shop to produce approximately 20 tons per day of cast iron pipe fittings from 2 to 24 in. diameter.

5. Modernization of a cleaning room in a steel foundry producing 500 tons per month of miscellaneous alloy and carbon steel castings.

Operations at each of these foundries will be described briefly:

Case 1.—The modernization and mechanization of this malleable foundry (Fig. 1) permitted a reduction of approximately 34 per cent in the labor cost, from raw material to finished castings ready for the machine shop. Melting was changed from cupola malleable to cupola-electric duplex with hot blast and moisture control. The cost of metal at the spout is reported to be less than cold blast cupola. Savings in elimination of pigged metal and reduced melting losses are reported to be substantial. The use of continuous, controlled atmosphere and electric annealers, combined with proper chemistry and metallurgical control, has resulted in a decrease from 168 to 45 hours for annealing, plus further cost reduction in fuel and pots.

Analysis showed 75 per cent of the production to be from 39 of the patterns (1,159 total patterns). Former production was largely on 12 x 18-in. split patterns, and production per molder averaged more than 300 molds per day. With a new automatic molding machine producing at 250 molds per hour, using a 22 x 36-in. flask, it was necessary to develop a composite pattern using up to 19 different castings to provide for 90 per cent of normal, annual requirements with minimum pattern changes. Product mix variations and the final 10 per cent were to be produced from a conventional unit using the old patterns.

Jigs were provided for core setting and five people produce the equivalent of about 8000 of the old 12 x 18-in. molds per 8-hour shift. Approximately 50 pounds of metal per mold permitted the use of 500-pound capacity pouring ladles on an electrified pouring monorail with one man to pour.

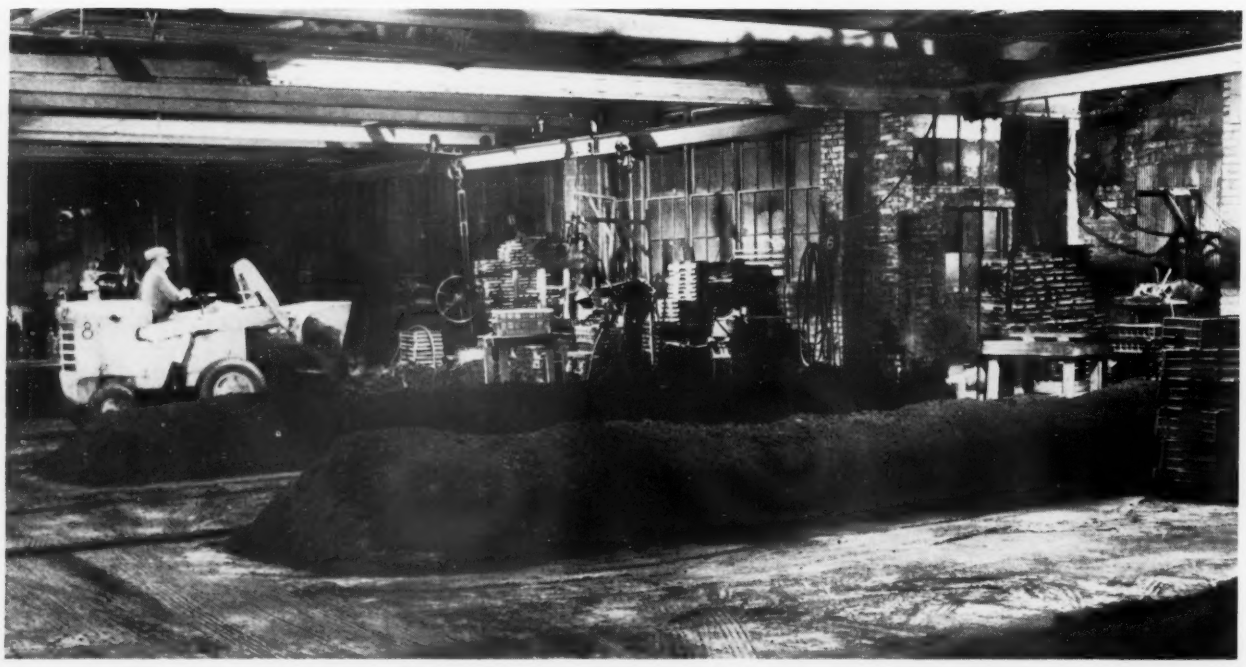
The drag half of the mold is made automatically and ejected to a core setting station. The jig of cores is placed and the half mold rolled over and the jig removed, mechanically, and pushed into closing position where the cope is placed and the closed mold pushed to a lowerator which places it on the power mold conveyor. Originally, it was thought weights would be required, but the use of cast steel flasks, properly ventilated, plus the weight of the sand proved to be enough to permit elimination of the automatic weight conveyor.

After cooling five minutes, the mold is pushed off onto vibrating rails over a shakeout. Sand and castings drop away from the flasks, and the cope and drag are automatically separated and returned by gravity to the molding machines.

Sand and castings are separated on the shakeout—the sand returning to storage bins over mullers. The castings drop into a tumbling barrel to remove cores and sprue themselves and discharge into baskets for a two-hour cooling ride. After cooling, the castings are dumped on a sorting belt, sorted to belts for delivery to continuous shot blast barrels, thence to bins. Castings are drawn from the bins by gravity into annealing baskets and then to continuous electric annealing ovens.

After annealing, the castings are dumped on a

Fig. 4—Jobbing gray iron and malleable foundry employs scoop truck to pick up sand and castings and deliver them to a shakeout and sand preparation unit



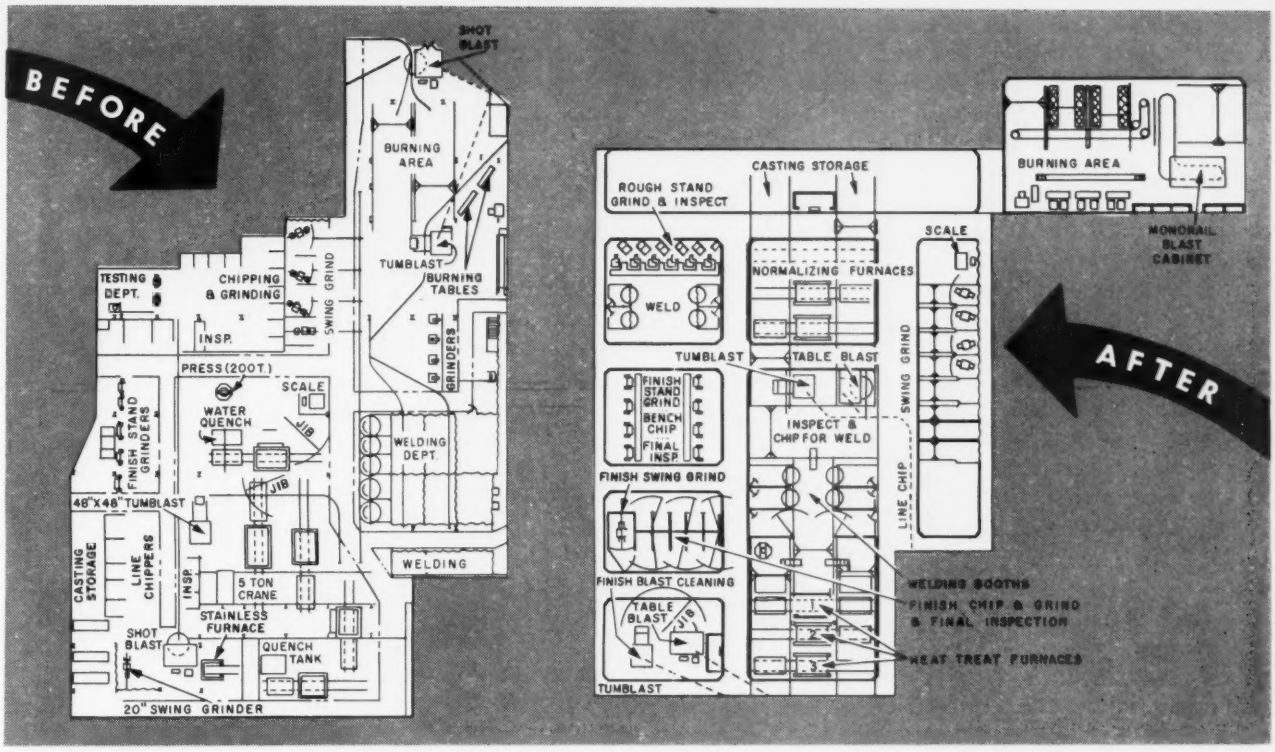


Fig. 5—Existing arrangement (left) of the cleaning room in a jobbing steel foundry. Rearrangement at right is to permit straight-line flow of castings

belt and fed to continuous shot blast barrels, thence to final sort and inspect and delivery to bins. From the bins, castings are delivered, as desired, to boxes handled on roller conveyor and by fork lift trucks to semi-automatic grinding and pressing stations, thence by gravity to boxes for delivery to the machine shop. Some 15 lift trucks (and several handlings) were eliminated.

The previous operation was "highly" mechanized but 34 per cent of total labor was eliminated.

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Case 2—A list of pumps and engine castings to be produced by this new foundry (Fig. 2) was furnished, together with a bill of material of castings required. Analysis again showed approximately 75 per cent of production from 25 per cent of the patterns. The work was separated into three general classes and "three foundries" were provided. A unit for squeezer and light cope and drag work in five sizes of flasks up to 20 x 20 in., and a unit for work in three sizes of flasks—24 x 24 in., 24 x 36 in. and 36 x 48 in. are available. Each has its sand conditioning and distributing system.

The intermediate unit utilizes a roto-mold setup which permits a pattern to be used once or repetitively with no molding delay. A "make-ready" station is used to assemble pattern and flask and apply facing, bedding sand, gaggers, etc., as required. The half mold then is indexed to a ramming station and, after ramming, is "struck off" as it is indexed to a finishing station, thence to a rollover, pattern draw machine. After the pattern is removed, the machine rolls back and the pattern is moved on conveyor either to the make-ready station or into storage.

Production up to 60 half molds per hour is readily attainable, and labor and handling is a minimum for maximum flexibility of 1 to 25,000 molds per year from a pattern. A power mold conveyor is used and cores are set while the conveyor is in motion. A cope roto-mold unit is synchronized with the drag unit and the mold closed as it passes the closing station.

A "third foundry" is provided for larger flasks, using a stationary speedslinger for ramming and the crane to draw patterns, set cores, close and pour.

New sand for coreroom and molding is delivered in boxcars and discharged from the cars through a track hopper, elevated and screened before delivery into storage bins. From the storage bins it is fed to a core sand unit, using a muller and measuring devices for oil and water. Cereal binder and other additives are weighed by scale at the platform. The sand, after being prepared, is blown to the point of use and distributed to the various bench, machine and core blower stations. A three-story coreroom is provided with corebox storage and sand distribution on the third floor, coremaking on the second floor, and core finishing on the main floor. The use of tower ovens permits loading at the second floor and unloading on the first floor. A continuous re-dry oven is provided for drying pasted and coated cores.

A material storage for 30-days' normal production of 45 tons of castings per day is provided in bins under a covered crane runway. Coke and stone are stored in bins with feeders to a charge make-up hopper. An inclined skip charger with cone bottom

buckets delivers the charge to the cupolas, which are arranged to deliver hot metal to an electric arc furnace or directly to pouring ladles. The arc furnace also is arranged to melt borings.

Hot metal is to be handled on electrified monorails and poured directly from the ladles "catching" at the furnace. Molds are automatically dumped onto the shakeout and the flasks returned to the molding stations or to storage by means of conveyor. The castings are placed in pans and are delivered to the core knockout, spruing and sorting station for cleaning and finishing. At the core knockout stations, the castings are vibrated to remove the cores which are broken up and mixed with water and pumped to a settling basin. Eventually a sand reclamation system may be installed to reclaim sand currently carted to the dump.

The castings then are placed on hooks for a continuous shot blast operation and, after cleaning and rough inspection, are transferred by truck to chipping and grinding station for finishing. A preheat furnace is provided for any corrective and repair welding that may be necessary. For the small castings, after spruing, these castings are charged into the skip hoist of a shot blast unit, blasted and discharged into pans for delivery on roller conveyor to the chipping and grinding station for final processing. The large castings are delivered to a core knockout station and, after blasting, are chipped and ground and, if necessary, repair welded. All castings are painted before delivery in containers to the casting storage area adjacent to the machine shop.

The entire project at the planned level of production should require approximately 50 per cent of the man-hours per ton for a class of work as compared to former conditions.

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Case 3—This plant is a jobbing, gray iron and malleable foundry producing approximately 25 to 30 tons of malleable and 30 tons of gray iron castings per day. A study indicated that at the level of efficiency with which this plant was operating—approximately 40 to 47 man-hours per ton of good malleable castings and approximately 24 to 30 man-hours per ton of gray iron castings—it was not practicable or economically justified to install mechanized sand and mold handling, continuous melting, etc., unless a very substantial increase in production was desired, without new buildings.

The foundry utilizes a windrow of sand and a portable molding machine with conventional hand-shoveling of sand into the mold (Fig. 4). Each molder pours his molds, using a 200 to 250 pound ladle suspended in a pouring device and mounted on a monorail type crane which covers the entire floor. The metal is delivered from the batch type air furnace or from the cupola in bull ladles and transferred to the pouring ladle at the floor.

After pouring, the shifters dump the molds and a scoop truck picks up sand and castings and delivers them to a shakeout and sand preparation unit. There are many other foundries that cannot justify a highly mechanized plant, but which can afford modern equipment that is suitable.

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Case 4—Layout for a specialty shop to produce approximately 20 tons per day of cast iron fittings from 2 to 12 in. in diameter is shown in Fig. 3. This plant requires from one piece per year from a pattern up to, perhaps, 20,000 molds from a pattern per year. There was a substantial problem to establish the principle of production techniques with an investment that would be justified and with a facility that was flexible enough to accommodate the range of work—i.e., from approximately 1 pound to 400 pounds in the same unit.

A progressive molding unit consisting of a make-ready station, a filling and jolting station, a squeezing station and a rollover draw station, is used to make molds. After the flask has been placed on the pattern and facing, if required, applied, the half mold is moved into the first machine position and the flask filled with sand and jolted. The table then is indexed to the second position where the half mold is squeezed, after which it is indexed (automatically struck off) and pushed off into a rollover pattern draw machine and the half mold moved on roller conveyor and by monorail crane to the mold conveyor for coring and closing. As the table indexes, a progressive molding operation is established and, after the pattern is drawn, the pattern may be reinserted in the line or placed in storage without interruption to the molding and without excessive handling.

The flexibility of such a unit for this class of work, together with the very high production per man-hour of effort, made this a reasonable solution to this problem.

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Case 5—The line drawing of Fig. 5 shows the "as is" cleaning room of a jobbing steel foundry producing approximately 500 tons per month of miscellaneous alloy and carbon steel castings, ranging from 1 pound to 1 ton in weight.

There are generally two weight classifications for processing—castings under 50 pounds and those over 50 pounds. The smaller castings are cleaned in blast barrels, ground on stand grinders, chipped on benches and welded on the rotary tables. The larger castings are cleaned in table blast cabinets, ground with swing grinders, chipped on benches in booths, and welded in cabinets.

All castings are rough cleaned before burning, normalized after burning, blasted, ground, chipped, inspected, welded, drawn, blasted, finish ground and chipped, finish blasted, sorted and delivered to the shipping room.

The equipment and work stations are arranged so that considerable back tracking and long transfers between operations are required.

At right is the rearrangement of this cleaning room to permit "straight-line" flow of castings. A continuous monorail cabinet blast was installed at the entrance to the cleaning room to thoroughly blast all castings before burning. Castings are unloaded from this cabinet directly to the burning

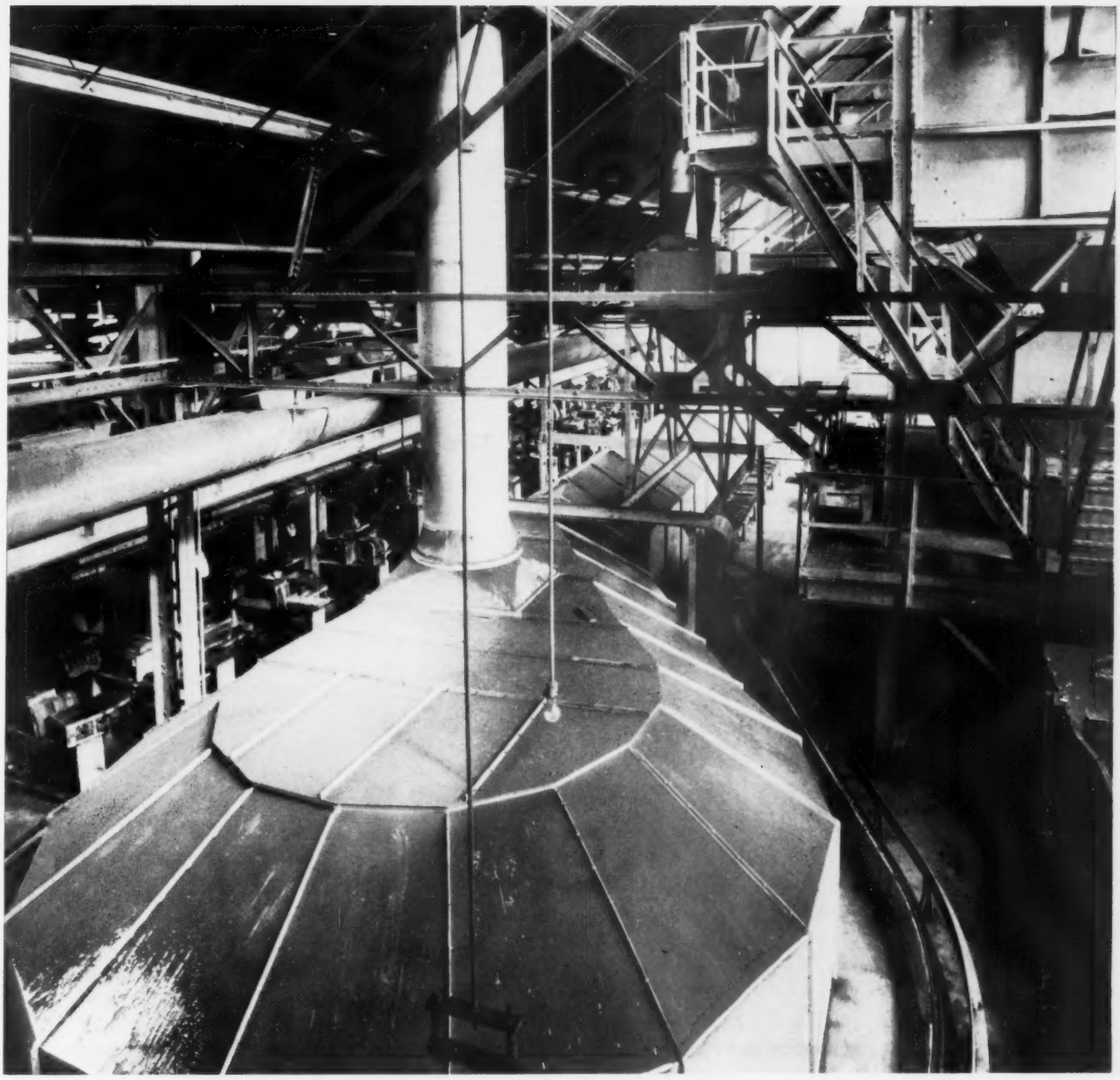


Fig. 6—This smoke and dust-free conveyor carries poured molds to a totally enclosed shakeout of a modernized malleable iron foundry

area and trucked to storage at the end of the cleaning room. From here, small castings travel down one side of the room for processing and large castings down the other side. Heat treating and blasting operations are performed in the center areas.

In addition to having straight line flow for better control, the average distance a casting travelled is reduced more than 50 per cent. A reduction of approximately 15 man-hours per ton was possible. Assuming a man-hour worth $2, the reduction in labor cost to produce 500 tons of castings per month is approximately $180,000 for an investment of approximately $200,000.

Summary—In summing up, there is no question but that the technological and metallurgical progress made in the foundry industry the last few years, plus the social progress resulting from substantially higher unit wages and take-home pay, have tended to obsolete even our mechanized foundries. It is of utmost importance in the competitive days ahead that the progressive, profitable foundry review and analyze those factors and those facilities affecting the ability to produce a high-quality product at a low cost, and that the most modern methods and facilities that are economically justified be adopted.

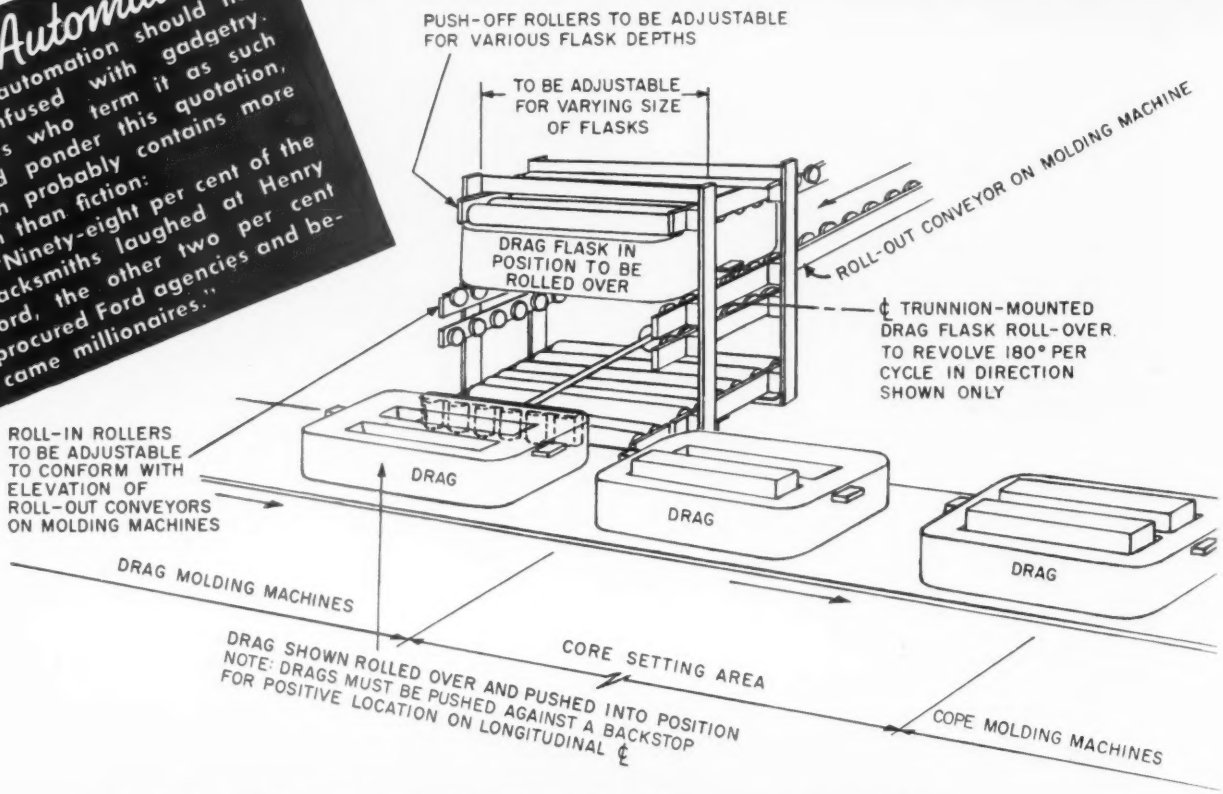
In general, a program that will return the equivalent of its cost in approximately three years by direct labor and material savings is a "must," and up to five years should be considered very seriously. In many instances, a complete new plant, including new buildings, can be amortized in ten years or less by the direct material and labor savings, even with no increase in production.

It is only the judicious expenditure of money to keep our plants modern and to permit the worker to give maximum production for his effort that will permit high-quality, low-cost production, high wages, and reasonable profits.

Why Automation?

True automation should not be confused with gadgetry. Scoffers who term it as such should ponder this quotation, which probably contains more truth than fiction:

"Ninety-eight per cent of the blacksmiths laughed at Henry Ford, the other two per cent procured Ford agencies and became millionaires."


PUSH-OFF ROLLERS TO BE ADJUSTABLE FOR VARIOUS FLASK DEPTHS
TO BE ADJUSTABLE FOR VARYING SIZE OF FLASKS
ROLL-OUT CONVEYOR ON MOLDING MACHINE
DRAG FLASK IN POSITION TO BE ROLLED OVER
℄ TRUNNION-MOUNTED DRAG FLASK ROLL-OVER TO REVOLVE 180° PER CYCLE IN DIRECTION SHOWN ONLY
ROLL-IN ROLLERS TO BE ADJUSTABLE TO CONFORM WITH ELEVATION OF ROLL-OUT CONVEYORS ON MOLDING MACHINES
DRAG
DRAG
DRAG
DRAG MOLDING MACHINES
CORE SETTING AREA
COPE MOLDING MACHINES
DRAG SHOWN ROLLED OVER AND PUSHED INTO POSITION
NOTE: DRAGS MUST BE PUSHED AGAINST A BACKSTOP FOR POSITIVE LOCATION ON LONGITUDINAL ℄

AUTOMATION

In the Foundry

THE last few years have witnessed a constantly accelerating interest in what has been termed the second industrial revolution. The first revolution, in a broad sense, was concentrated upon producing machines that turn, bore, stamp, press, punch, ram, squeeze or perform some other operation on various different materials. These operations had previously been performed by the main strength and awkwardness of the human muscles. The second revolution, which is generally spoken of as "automation," concerns itself mainly with selecting, transferring and handling materials automatically into, through and out of the machines that were developed during the first revolution.

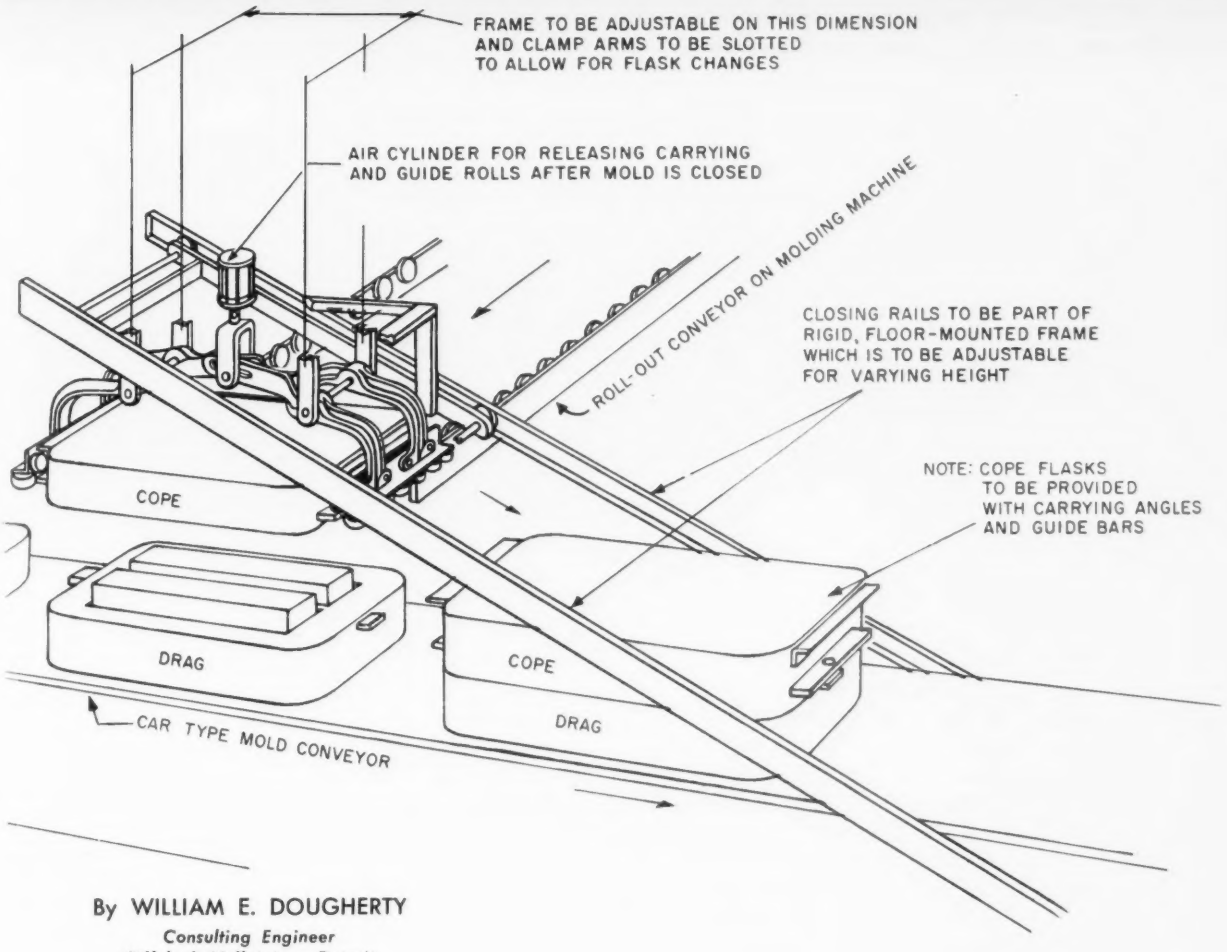
There have been many articles written and many talks delivered on the subject of automation. However, it seems that most of these articles and talks gingerly side-stepped the subject of automation in the foundry. Even though there has been little formal comment on automation for the foundry, this article will attempt to present in a question-and-answer series the consensus on the subject gleaned from many informal discussions with forward-thinking foundrymen of ambition and imagination:

Q. What is this new thing "automation" that everyone talks about?

A. It is not actually anything new. It is just the fact that the emphasis placed upon it in the last few years has elevated it to a level where it is worthy of its own special name. Though there are many definitions of it, and some of the more precise people will argue the exact connotation of the word, it is simply the process of producing automatically.

In a more pointed sense, it is the machinery required to move materials from one processing operation to the next without the application of any human endeavor.

Q. That sounds great for a press plant or a machine shop, but how about trying to keep these complicated machines running in a foundry?



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This shows a set of mold handling automation for a tight flask, cope and drag operation. Although the activating controls and mechanisms, along with the gaging apparatus, have been deleted in the interests of illustrative clarity, the operation proceeds as follows:

A drag mold is rolled over and pushed onto the moving conveyor. As soon as the push-off cylinder is retracted, the rollover device is ready to roll a succeeding drag, which has been indexed into it.

The cope flask handling device must move down the inclined rails at a speed calculated so that its horizontal component equals that of the mold conveyor. When the mold is closed, the cylinder on top of the cope car releases the cope carrying arms, the car is returned to its starting position, the carrying arms are re-set and another cope is indexed into the device for the cycle to be repeated.

A. While it is true that people who design, operate and maintain machines for a press plant or a machine shop do not have to cope with all the sand and dirt that foundry designers do, it is also true that the machines with which they work are required to be much more complicated than ours.

Consider, for a moment, these facts: After a piece leaves the first press in a line it has a definite shape. As the dies are changed, so are the shapes. All operations in a machine shop are performed on parts or pieces whose shapes and dimensions may change at the whim of either the product engineering staff, or the consumers of the end product.

In both of these shops and in practically every other phase of the metalworking industry, the automation must conform to the parts being handled.

On the other hand, the foundry, with the exception of certain core finishing operations, core setting and some knockout and cleaning operations, need not be concerned particularly with the shapes of the pieces produced. We produce our cores with boxes and driers, and our molds with flasks. We can make the outside contours and dimensions of these boxes, driers and flasks in any shape we want.

In other words, we could conceivably produce cylinder heads, flywheels, pipe fitting, or what have you, using the identical automation as long as we maintain the same handling surfaces and projections on our boxes, driers, flasks and all

other types of containers.

Even though practically every new machine or idea offered to the foundry industry runs head-on into the standard remark—"It won't work when you throw a shovelful of sand on it"—this argument hasn't seemed to bother manufacturers of molding machines, mullers or core blowers, to name a few. There are not many production machines in industry that are required to surpass the accuracy demanded of the large molding machines in a present-day foundry, yet they perform all their operations under a "mountain" of sand.

Q. Why is this automation thing so desirable?

A. Any degree of automation will lessen worker fatigue, and therefore increase production and reduce the incidence of accidents.

Full automation will eliminate many dull, dangerous or dirty jobs in a foundry.

Since a machine has no brain, it cannot perform a given job in any other manner than that for which it has been designed. It cannot, for instance, argue with the adjacent machinery about which is the better horse in the fifth at Arlington and, during the argument, close a mold backwards.

The machines will not ordinarily go on strike. If a machine does sit down on the job, there is no doubt about who abused whom. It is the management's fault.

When a machine gets old and worn out, it can always be thrown in the cupola—an operation, which, if practiced on similarly inefficient employees, is generally frowned upon. As soon as a machine is put into operation, the process of depreciation and write-off is begun. There are no such things as different shifts, shift differentials or overtime pay for machinery.

Although the physical depreciation of the human roughly parallels that of a machine, a man's wages per unit of work will increase, whereas the "book value" of the machine will decrease with age.

With some few exceptions, a machine can perform a job faster and more accurately with unlimited repetition than can a man.

Q. What must a foundry do to initiate an automation program?

A. Although any process can be automatized if there is no regard given to cost, the complexity of the automation equipment and, therefore, its maintenance costs and purchase price are reduced sharply as the degree of standardization injected into the process is increased.

With these thoughts in mind an automation program should start with the foundry tooling: Coreboxes, driers, flasks, patterns, etc.

The largest box that can be run on a given core making and drawing setup should establish the standard size for these operations. Other boxes to be run on this setup should be built up to equal the size of the largest box. In many instances this will mean that smaller cores are to be blown in gang coreboxes.

This standardization of coreboxes is not too important in itself, but will result in driers which are of a standard size, and therefore allow a standardized handling for the cores through the rest of the system. Pattern plates should all be of a standard size and drilled to accommodate the same size flasks.

The accompanying sketch shows a drag rollover device, a cylinder for pushing the drag half mold onto the mold conveyor, and a machine that receives the cope halves from a molding operation and closes the mold.

The sketch will serve to clarify the argument in favor of standardized patterns and flasks.

The equipment as shown does have some adjustment designed into it. However, a pattern change which requires a different sized flask will dictate these changes to the mold handling equipment:

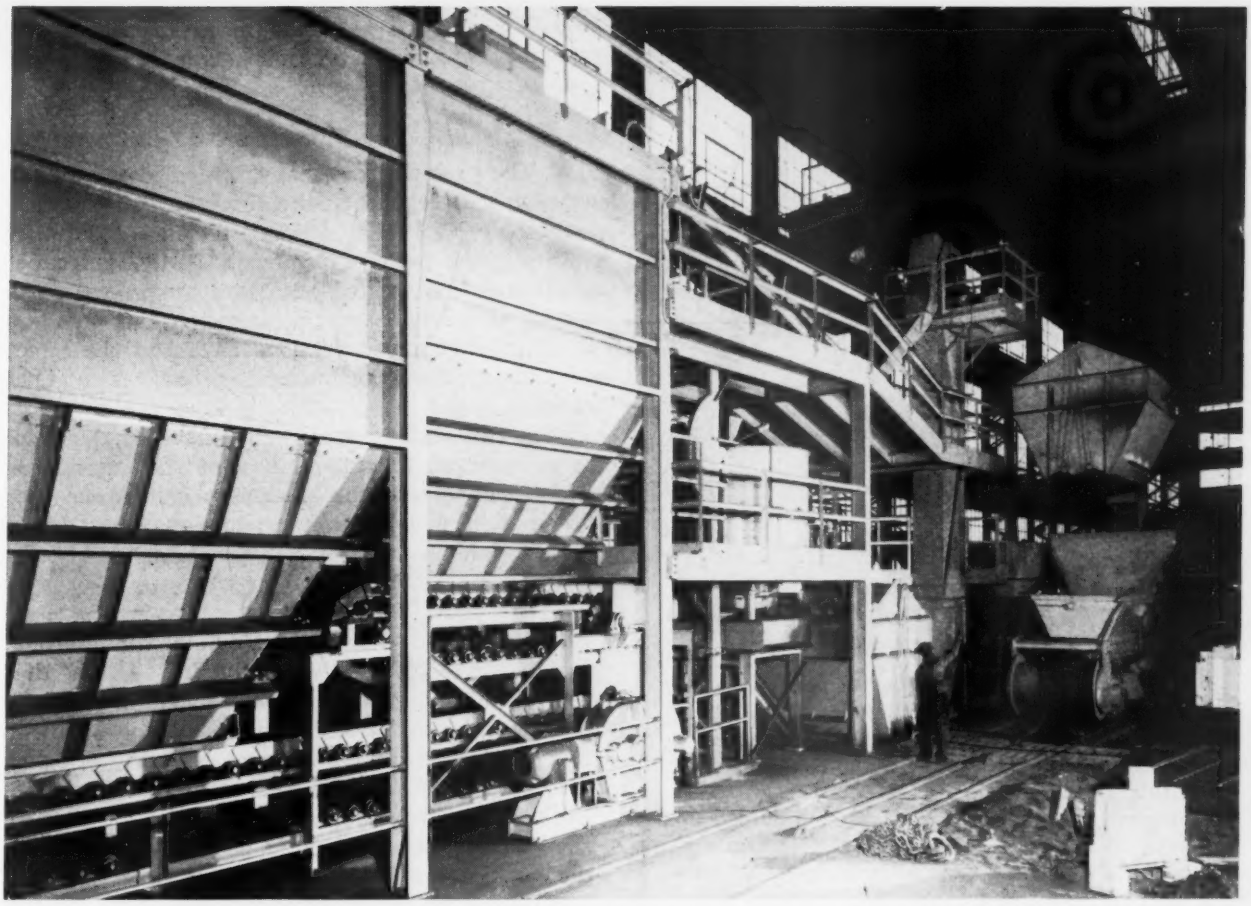
1. The roll-in, roll-out conveyors will require respacing, as will the roller sections on the machine.
2. The rollers on the drag rollover device will have to be respaced, possibly longitudinally as well as vertically.
3. The flask stops (not shown) will require readjustment.
4. The stroke on the push-out cylinder must be readjusted.
5. The flask holding arms on the cope handling and closing machine will require adjustment.
6. The cope flask guide bars (not shown) will require adjustment.
7. The controls which release the cope car for its downward travel must be moved.
8. The controls which activate the cylinder releasing the cope carrying and locating arms must be relocated.
9. The control which activates the cope car return mechanism must be relocated.

The nine steps as outlined above assume that the flasks which accompany the pattern change do not match the previous flasks in any dimension.

Any dimensional similarity between the flasks will reduce the number of changes to be made, until the ideal is reached, which is, of course, a standard flask size requiring no automation adjustment whatever.

Q. Since the majority of foundry companies contemplating an automation program would be talking of modernizing their present facilities rather than constructing a new plant, where would be an easy place to start?

A. The gospel of automation should not be spread to the point where people assume that any phase of it will come easily. It will spell disaster to attempt to just start somewhere and work on through the various operations with the hope of ending up as the proud operator of an automatic foundry. Planning for automation will require much more concentration and adherence to detail than has any type of a previous planning program.



An example of a sand handling system in a jobbing foundry. This type of installation, which, in one form or another, is used as standard equipment in modern foundries, comes under the general heading of automation

The production rates of all pieces of equipment in a given line will have to be balanced with respect to each other in order to eliminate any bottlenecks.

Layouts will have to be much more accurate than they have in the past. Particular attention must be paid to elevations of the different process machinery to eliminate unnecessary raising and lowering of the materials and parts in process.

A concerted effort must be made to have the machines laid out "in line," i.e. a part or flask, or whatever the particular machines are processing should emerge from one machine in the position in which it is to enter the next machine. If the process machinery can be laid out to follow the "in line" pattern, it will reduce the complexity of the automation required by a large degree. If it is impossible to lay the machinery out "in line," it is advantageous to perform the raising, lowering, rotating or whatever motion is required with automation between the process machines, rather than penalize the machine's productivity by adding this extra motion to its normal cycle.

If a department is to be automatized, it should be completely engineered prior to the purchase of any equipment. Be extremely wary of any last-minute ideas on the "let's change this machine and buy a different type" theme. It may require a revision to the entire line.

Q. Which foundry department will provide the greatest return if automatized?

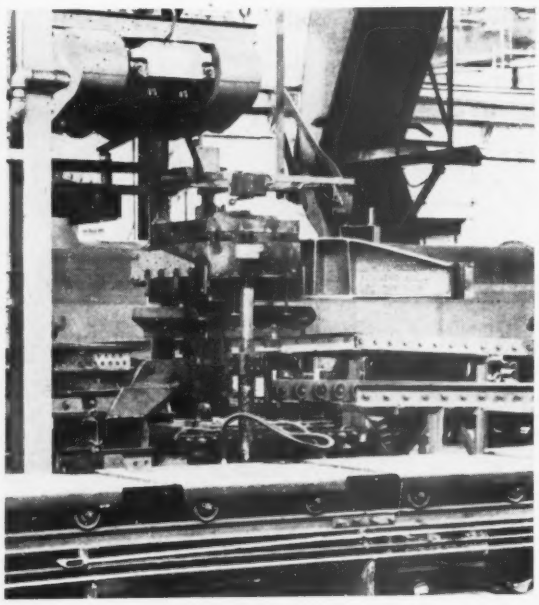
A. The old foundry adage that the molding sets the pace seems to follow through in the question of automation.

Although there are no two foundries which are identical in layout, operation or production, and full automation seems to lend itself much more easily to a tight flask, cope and drag setup than it does to a matchplate, snap flask and jacket job, any foundryman contemplating an automation program should take a good, long look at his molding operation, regardless of its type, before moving to another department.

As a matter of fact, there are many foundries in operation today which could return their investment in a fully automatic flask handling system within a year.

Q. It seems that everyone talking about automation keeps mentioning enormous production rates. If these figures of 200 and 300 molds per hour from a pair of machines are correct, isn't the use of automation then confined to a very few high-production shops?

A. Although full automation is ably matched to the very high production shops similar to those



Molding machine installation in an automatic molding line. Flask at left is in position to be indexed into the molding machine. The molding machine has squeeze arm swung out and molder's batch hopper is in position over the pattern. As the squeeze arm is returned to its position over the pattern, the batch hopper is swung under main hopper, where another batch of sand is metered to it. Note wheel conveyor to the right of the machine for delivering rammed flasks to the closing station

operated by the automotive companies, its benefits need not be confined to these companies only.

It is probable that many of the process machines in operation throughout industry today were originally developed for some large producer, such as one of the automotive companies, and it is also probable that there was some skepticism about the scope of their use at that time.

The main thing required to allow automation is some standardization of the foundry tooling.

It is true that many purchasers of castings provide their own pattern equipment, which, sad to relate, often looks as if it were made at home with a golf club and a barlow knife; however, if the customer's requirements on these particular castings are large enough to warrant automation, they are, no doubt, large enough to warrant some money being spent on pattern equipment.

It is expected that the general acceptance of automation and standardized pattern equipment for given machine sizes will eventually seep through to the customers. In the meantime, many patterns can be adapted for use on the automatized line.

As the automation movement gains acceptance in the foundry industry, it may have the beneficial effect of standardizing machine and pattern sizes. At the same time it will force those people who buy castings and provide their own patterns to either pay the high dollar or furnish pattern equipment to an industry-wide standard.

Q. What are the problems of automation?

A. The problems are many, and their successful solution will depend on the flexibility of the management.

First, and perhaps foremost, is the personnel problem. A concerted education program for the employee is mandatory, because the long-standing habits of foundry operations have had the effect of building up the natural prejudices against change.

This education program should be started well in advance of the installation of the automation equipment so that the employees understand that automation will increase production, lower costs, and will eliminate many dangerous and distasteful jobs.

There must be a wide-scale propaganda campaign instituted to bolster the automation program.

There have been many machine installations that were basically good, but were never allowed to operate because of a negative attitude toward them. Conversely, there have been many poorly designed installations which have been made to operate, because a positive propaganda campaign, prior to their installation, had fired people with a "do or die" attitude toward them.

Further, the actual man required to head up a foundry automation program is of a breed that is hard to find. Such a man should be a cross between a foundryman, a machine designer and conveyor engineer, with a liberal dose of salesmanship thrown in for good measure.

The men who will be responsible for the maintenance and operation should be familiar with the equipment prior to its installation.

If at all possible, these men should function as members of the planning team. If it is not feasible to release such men from their present jobs to act on the planning group, it is a good idea to hold regular instruction sessions for them during the design period.

Most foundries operate today with a maintenance department of some type or another. The unhappy fact is, "maintenance" is a misnomer in too many shops. In these shops the so-called maintenance department functions as a repair department. A shop that operates automatically will find itself with a lot of expensive equipment standing idle unless there is a change in maintenance operations.

The installation of recording instruments to indicate variations in horsepower, air pressures, cycle times, etc. on various pieces of equipment will serve as valuable tools in detecting variations from normal operations and, therefore, will indicate probable trouble spots.

Some changes in the standard pattern rigging must be instituted to speed up the operation. A production run that formerly occupied 50 per cent of your machine capacity may, with automation, occupy only 25 or 30 per cent of capacity. Because of this the frequency of pattern changes

may be doubled or in some cases trebled.

This increased production rate will also add a burden to your scheduling, accounting, distribution and sales departments as well as the more obvious changes to be worked on the engineering, maintenance and operating forces.

Some of these problems posed by automation seem to loom fairly large, but they have been overcome in machine shops, which require more complex automation than the foundry does. Anything that machine shop personnel can do, can be done as well or better by foundrymen, because the very nature of foundry operation, as it has been carried on in the past, has had the net effect of developing resourcefulness. Add to that the fact that foundry production, as discussed earlier, lends itself better to automation than does that of the machine shop.

Q. From whom does a foundry procure this automation?

A. There are many engineering firms, conveyor companies and machine builders who have the ability and capacity to design and produce automatic equipment. However, since the majority of automation will consist of custom-made machinery, it is not economically feasible for one of these concerns to draw up a molding line or core line that has full automation and then go looking for a foundry in which it would fit and which also has a management who will buy it.

Unfortunately, automation is not something that can be packaged and sold, like corn flakes. It probably never will be, because individuals will still have their own ideas on how a particular problem should be solved.

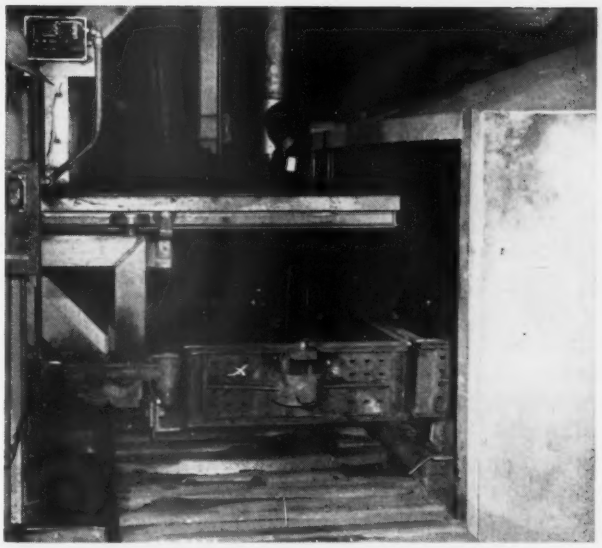
This may be a superfluous statement, since foundrymen are a closely-knit group, but the firms contacted to formulate an automation program should have a firm grounding in foundry practice and materials.

A man who has a long record of inventing sewing machine bobbins or welding jigs for auto bodies will probably have to "unlearn" a good portion of what he knows before he can start a foundry job.

In view of the fact that the initiation of an automation move must start from the foundry, it may well be that one of the stumbling blocks in the way of mechanical progress will be the problem of communicating the foundries' needs to the people who hold the purse strings.

In the past it has been the practice, and a source of pride, for foundrymen to produce quality castings with a minimum of equipment. If the foundry industry is going to remain in the cost race with other branches of industry, foundrymen are going to have to reverse their traditional stand and start a concentrated campaign to convince the people on top that they must have this new equipment.

This task will be doubly hard for foundrymen, because, in addition to the fact that the people who hold the money probably wouldn't have it unless they were fairly cagey about keeping it, they know very little about foundry problems—



A drag mold pusher in operation. This device pushes drag molds from a moving conveyor onto the drag shakeout. Consisting of a simple air cylinder, the pusher saves 1½ men per shift and returned its cost in about three months

and usually care less. However, this indifference and lack of knowledge is not their fault; it is the fault of the foundrymen. Either foundrymen lack the eloquence to make their wants known, which would be an involuntary fault and for which they should be pitied, or these people on top have never been able to crack the barrier of mystery with which the foundry has surrounded its alchemic activities. The propaganda campaign on automation which has been prescribed for the employees should be preceded by another of the same type aimed at the top.

The foundry industry of the future will find itself in double harness with automation, which will pull its share of the load by virtue of higher production, lower costs, safer working conditions and providing an over-all competitive place in line at the head of the industrial parade.

The foundry industry will, however, find itself plodding along in a single horse rig at the tail end, unable to pull its share of the load, unless it remembers and adheres to, these salient facts:

1. Of all branches of industry, the foundry should be among the easiest to automatize.

2. The cost and complexity of an automation system can be figured as an inverse proportion to the amount of standardization introduced to the foundry tooling program.

3. An automatized line must be thoroughly engineered to the last detail, before any of its component parts can be purchased or installed.

4. A concerted educational campaign must be loosed on the employees, before they are loosed on the machines.

5. The old bromide "the squeaky wheel gets the grease" should be impressed upon foundrymen, who must learn to squeak in strident and penetrating tones.

Inventory of Foundry

DURING the last ten years the foundries of the United States and Canada produced more than 160 million tons of castings. To accomplish this record-breaking output, they installed more equipment than in any other previous decade of the industry's history.

Impetus behind the heavy demand came from two directions: (1) The need for increased capacity to meet the expanding requirements of casting consumers, and (2) the trend toward modernization and mechanization—a movement aided in some degree by the scarcity of skilled workers.

New Designs Aid Demand—Another stimulus to equipment purchases since World War II has been the development of improved types of foundry machinery, with their inherent savings in production costs. The numerous innovations in equipment design in recent years followed a period during which depressed business conditions and a war provided little opportunity for development work.

FOUNDRY recently conducted a study of foundries in the United States and Canada to determine the number and age of major types of equipment. The study was made among a representative group of foundries of various sizes and types. Replies were received from more than 1000 individual plants, and the data tabulated on the following 16 pages is based on an excellent cross section of the industry.

Obsolete Units Discarded—While a large part of the equipment installed during the last ten years is represented in the industry's increased capacity, there are indications that many machines have replaced obsolete units. This may be seen by a comparison of the relative age of equipment today compared with that of seven years ago, when a similar study was made. This shows that the percentage of various types of equipment more than ten years old today is not markedly different from that of 1947.

For instance, approximately 40 per cent of existing molding machines are more than ten years old; in 1947 the proportion with that age was 32 per cent. Core blowers more than ten years old represent 17 per cent of the total, and in 1947 that age bracket included 14 per cent of the units. Similarly, 29 per cent of all mullers and mixers have passed their tenth birthday, while in 1947 22 per cent of the units had done so.

Mechanization Trend Continues — The term "mechanization" necessarily has various meanings when applied to foundry operations. This arises from the fact that the type of equipment required to mechanize operations of a large foundry would be out of place in the small jobbing shop. At the same time, equipment is available which enables the latter to eliminate manual handling to a large degree and in essence comprises mechanization.

In this study, foundries were asked to indicate whether or not they had mechanized these four types of operations: Sand handling, mold handling, core handling and shakeout handling. Replies, compiled in the accompanying table, showed that 27.6 per cent of all foundries now have mechanized sand handling equipment. The percentage varied from 15 per cent for the smallest plants to 100 per cent for those foundries with more than 1000 employees.

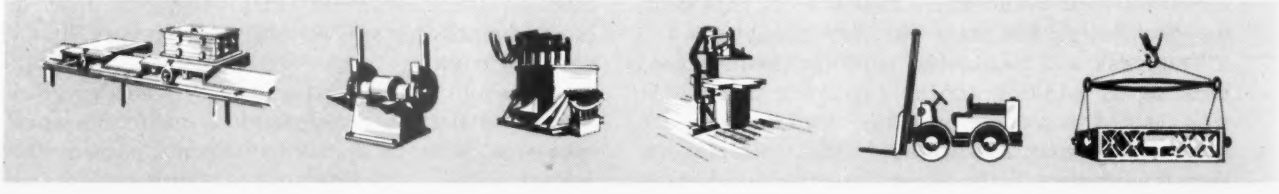
It is interesting to note that seven years ago, only about 16 per cent of all foundries were handling their sand mechanically. This means that since that time, about 620 foundries have provided such facilities.

Molds are handled mechanically by 17 per cent of all foundries. This compares with 12 per cent in 1947. Mechanical shakeouts are employed by 19.5 per cent of all plants, and an additional 15 per cent indicated that they expect to install such equipment.

A sizable number of foundries which at present do not have mechanized sand and mold handling apparently are planning to acquire such equipment. Replies in the study showed that approximately 13 per cent of those foundries without such equipment expect to order it.

Mechanization varies rather widely among foundries of different types. For instance, 61.5 per cent of all steel foundries have mechanized sand handling, but this is to be expected since the average producer of steel castings ranks among the large shops of the foundry industry. Only 28 per cent of the nonferrous foundries and about 23 per cent of the gray iron shops handle their sand mechanically.

Malleable foundries rank relatively high in mechanization, a situation accounted for partly by



Equipment

What comprises the physical plant of the foundry industry? How many units of the various types of major equipment does it have and how old are they? What are foundries' intentions regarding further mechanization?

Here are the answers, based on confidential information given the editors by more than 1000 foundries of the United States and Canada. These foundries were selected carefully so as to provide an accurate cross section of the industry. Sampling and projection of the data to give industry-wide results followed the latest approved methods.

the fact that the average malleable foundry has a higher capacity than the average gray iron or nonferrous plant. Approximately 21 per cent of the malleable and steel foundries which presently do not have mechanized sand handling indicated they expect to mechanize this operation.

Buying Intentions—In this study foundries were asked to indicate what types of equipment they expected to order during the next two years. This was in addition to their intentions concerning installation of mechanized handling systems. The replies, of interest primarily for the trend in thinking among foundries concerning plant improvements, indicate major attention is directed to molding, coremaking, sand preparation and material handling equipment. Approximately 21 per cent of all foundries said they will be in the market for molding machines. Twelve per cent of all plants plan to buy mullers and mixers, and a similar percentage are prospective purchasers of core blowers. Lift trucks, monorails and roller conveyors rank high in the list of material handling equipment most favored by prospective foundry purchasers.

It is rather significant to note that the percentages of foundries indicating buying intentions, in the case of practically all types of equipment, are equal to or in excess of the percentages reported in the 1947 study. It will be recalled that seven years ago the industry was attempting to expand its capacity in the face of extremely heavy postwar demand for castings.

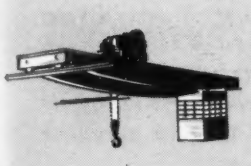
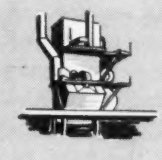
Small foundries are well represented among likely buyers. To a certain extent this probably reflects the thinking as expressed by one small foundry operator in replying to this study's questionnaire: "We feel that smaller foundries similar to us must mechanize in some degree to meet the competition of mechanized larger foundries."

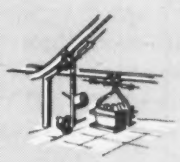
At the same time prospective buyers are weighing carefully their choice of equipment. One foundryman offered this comment: "Purchase of low priced, poorly engineered equipment will jeopardize the efficiency of a foundry operation far in excess of the original cost saving."

On a somewhat different note, and just as a reminder that production of castings involves men as well as machines, one respondent made this remark: "If the jobbing foundry industry is not soon able to hire young men to learn the skilled trade of molding, there will not be any need for foundry equipment."

MECHANIZED HANDLING SYSTEMS IN USE AND PLANNED

	—SAND—		—MOLD—		—CORE—		—SHAKEOUT—	
SIZE OF FOUNDRY	**Now Have**	**Plan To Install**	**Now Have**	**Plan To Install**	**Now Have**	**Plan To Install**	**Now Have**	**Plan To Install**
Over 1000 employees	100 %	0.0%	71.0%	0.0%	74.2%	3.2%	100 %	0.0%
500-999 employees	90.6	7.8	62.3	6.6	47.5	9.8	74.6	7.9
250-499 employees	88.0	10.4	56.9	17.2	31.9	8.6	71.5	13.8
100-249 employees	51.7	15.9	33.8	8.6	16.0	9.0	41.0	15.8
50- 99 employees	26.6	18.4	16.9	12.3	6.4	6.4	22.9	14.5
20- 49 employees	20.1	17.5	12.1	14.3	4.6	4.1	13.9	14.3
Under 20 employees	15.3	13.6	7.9	13.2	0.9	2.8	6.1	15.8
All Foundries	**27.6%**	**13.3%**	**17.0%**	**12.7%**	**7.3%**	**3.9%**	**19.5%**	**14.8%**
TYPE OF FOUNDRY								
Gray Iron	22.7%	16.3%	14.8%	9.5%	7.7%	6.3%	18.5%	15.9%
Malleable Iron	54.7	20.9	47.4	16.6	33.6	14.7	54.0	17.8
Steel	61.5	21.1	26.0	12.6	19.6	7.3	43.1	18.2
Nonferrous	28.3	15.2	17.1	12.2	3.9	2.5	17.1	15.1



Molding and Coremaking

ABOUT 23 per cent of all power molding machines in use today are less than five years old, and nearly 63 per cent are less than ten years old. This means that approximately 10,000 machines were installed since 1949, and more than 27,500 since 1944.

While molding machines rank relatively high among the various types of foundry equipment in best demand the last ten years, their activity was overshadowed by that of core blowers. Our study shows that of the approximately 9600 blowers in service today, 83.5 per cent were acquired since 1944.

Growing popularity of core blowers stems from the general trend toward foundry mechanization; also from the wider adaptability of this equipment as a result of new and improved designs.

Blower Use Is Widespread—Core blower use no longer is confined to the larger foundries and to extremely high production runs. Nearly 30 per cent of the smallest foundries—those with fewer than 20 employees—are equipped with blowers. This percentage, incidentally, is double what it was seven years ago.

Most of the smallest foundries operating core blowers have only one unit. The number per foundry increases with the size of shop to approximately an average of 2 in the 20-49-employee bracket, to 4 in the 100-249 group and to 30 in the over-1000-employee plant. Corresponding figures for molding machines per foundry in these four size groups are 3, 7, 18 and 60.

Nearly one-fourth of all foundries which indicated in this study that they expected to order core blowers within the next two years have less than 20 employees.

If a machine that has been in service more than 20 years should be termed "old," foundries have some 4000 old power molding machines and 500 old hand squeeze models in their shops. When spread among the 5812 foundries of the United States and Canada, however, these veteran machines constitute a relatively small part of the average plant's production facilities. Actually, one-fourth of these old machines are owned by the 59 largest foundries and only 730 are located in the 3892 smallest shops.

Manual Molding Still Important—While this is the so-called machine age, hand molding methods still are widely practiced—and are highly essential—for certain types of foundry work. This is indicated by the fact that more than 9000 portable pneumatic rammers were acquired by the industry the last five years. A like number in service are five to ten years old.

The nearly 23,000 pneumatic rammers in use are fairly evenly divided among foundries of various sizes but are concentrated primarily among plants with 50 to 500 employees. These foundries, comprising 30 per cent of all shops, use 60 per cent of all rammers.

2300 Ovens Over 20 Years Old—More than one-half of existing core and mold drying ovens have been installed since 1944. At the same time, a sizable number of old units still are in service. As shown in the table at the right 17.7 per cent—or 2300 ovens—are more than 20 years old. A greater portion of the ovens in the largest foundries are in this category than is true of the smaller shops; in fact, it is twice that of the industry as a whole. One-third of the ovens in the 59 largest foundries are in the classification of more than 20 years old.

Increased use of the continuous type core oven, in some instances replacing several batch type units, is reflected in the fact that total number of individual ovens in service has shown practically no change the last seven years.

Approximately 10 per cent of the 4928 foundries currently operating core and mold drying ovens said in this study that they planned to purchase new units during the next two years.

Power Molding Machines

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION: Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	59	3546	25.7%	23.2%	21.5%	29.6%
500-999 employees	113	4386	20.5	43.9	30.0	5.6
250-499 employees	252	7447	19.3	30.7	32.5	17.5
100-249 employees	525	9542	22.7	40.0	29.7	7.6
50- 99 employees	651	7839	29.6	37.3	29.4	3.7
20- 49 employees	1027	6941	20.5	53.0	22.1	4.4
Under 20 employees	1428	4340	24.0	45.9	28.0	2.1
Total	**4055**	**44041**	**23.1%**	**39.7%**	**28.2%**	**9.0%**

Hand Squeeze Machines

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION: Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	6	79	0.0%	9.8%	90.2%	0.0%
500-999 employees	27	397	9.9	23.4	59.4	7.3
250-499 employees	69	857	20.3	51.1	23.6	5.1
100-249 employees	132	1528	29.4	39.2	24.2	7.2
50- 99 employees	164	1050	34.6	14.1	43.8	7.5
20- 49 employees	268	1251	10.8	39.4	34.7	15.1
Under 20 employees	597	1247	14.3	48.8	32.1	4.8
Total	**1263**	**6409**	**20.9%**	**37.3%**	**33.9%**	**7.9%**

Core Blowers

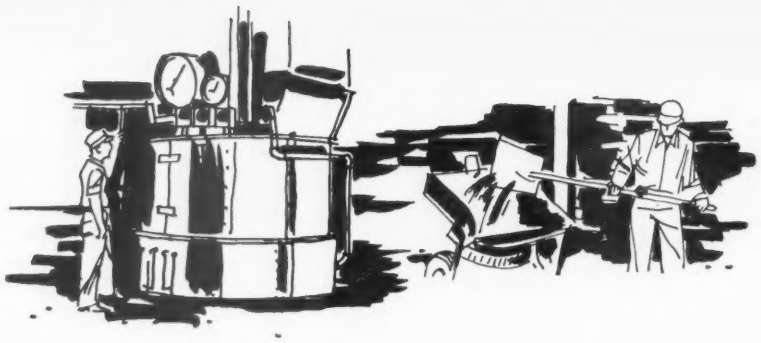
SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION: Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	54	1573	54.8%	24.8%	18.6%	1.8%
500-999 employees	113	1054	34.1	34.7	27.7	3.5
250-499 employees	227	1270	34.3	37.5	25.7	2.5
100-249 employees	498	1991	46.9	42.6	9.0	1.5
50- 99 employees	495	1386	41.7	45.1	11.0	2.2
20- 49 employees	678	1370	40.4	51.4	7.5	0.7
Under 20 employees	728	977	41.3	50.8	7.9	0.0
Total	**2793**	**9621**	**42.9%**	**40.6%**	**14.8%**	**1.7%**

Pneumatic Rammers

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION: Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	50	2208	39.4%	42.9%	13.8%	3.9%
500-999 employees	99	2959	38.4	38.0	22.5	1.1
250-499 employees	212	4238	33.1	42.3	23.3	1.3
100-249 employees	463	4943	48.5	43.9	6.6	1.0
50- 99 employees	571	4274	39.5	46.2	12.9	1.4
20- 49 employees	772	2842	46.2	44.3	9.0	0.5
Under 20 employees	656	1469	37.1	56.7	6.2	0.0
Total	**2823**	**22933**	**40.8%**	**40.0%**	**13.9%**	**1.3%**

Core and Mold Ovens

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION: Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	59	1245	20.1%	22.4%	23.0%	34.5%
500-999 employees	124	1100	16.7	29.7	36.3	17.3
250-499 employees	262	1582	14.4	31.5	34.3	21.8
100-249 employees	580	2151	18.9	37.5	27.4	16.2
50- 99 employees	789	1948	16.3	39.8	27.6	16.3
20- 49 employees	1220	2245	22.8	40.7	25.1	11.4
Under 20 employees	1894	2784	18.6	37.9	28.0	15.5
Total	**4928**	**13055**	**18.3%**	**35.7%**	**28.3%**	**17.7%**



Sand Preparation

A SUBSTANTIAL portion of the sand conditioning equipment used by foundries is relatively modern. About one-third of all mulling and mixing machines are less than five years old and only 30 per cent of them are more than ten years old.

Mobile type of mechanical-feed conditioning units shows approximately the same age breakdown as the stationary units. Portable, hand-feed type conditioners on the average are relatively newer in that less than 20 per cent were installed prior to ten years ago.

Mullers and Mixers Preferred—Mullers and mixers comprise the preferred type of sand conditioning unit. The foundry industry employs 7940 of them, compared with 4250 of the portable type and 1515 of the mobile units.

Smaller foundries in general have been somewhat more active than the larger shops in recent years in purchases of sand conditioning units. This is indicated by the fact that the percentage of the former's equipment less than ten years old is higher than that of the bigger foundries. A similar situation prevails for sand units less than five years old.

Small foundries—those with less than 50 employees—average slightly more than one conditioning unit per plant. The average increases to more than five units per foundry among plants with more than 250 employees.

Sand conditioning facilities rank high among the equipment foundries plan to buy the next two years. The number of companies expecting to order mullers and mixers is close to 20 per cent of the total of foundries already operating such equipment.

Separator Use Increases—Magnetic separators are becoming more widely used in foundries. A 45 per cent increase over the number in use in 1947 is indicated by results of this study. This brings the total number to about 2350, of which 75 per cent have been installed the last ten years. While individual separators find their greatest application among the higher production foundries having a central sand preparation system, magnetic separators are incorporated in certain types of floor-operated mobile sand preparation units adapted to small shop operation.

Power riddles find application in foundries of all sizes, but 32 per cent of the industry's total of nearly 6000 are used by the smallest plants and 57 per cent of them are in shops with less than 50 employees. Most riddles apparently are replaced within 20 years, there being few older than that still in service. Nearly 65 per cent are less than ten years old.

Mullers and Mixers

	DISTRIBUTION		AGE OF UNITS			
SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	59	814	33.8%	29.0%	21.1%	16.1%
500-999 employees	122	708	17.6	42.8	32.3	7.3
250-499 employees	265	1068	22.9	35.4	33.6	8.1
100-249 employees	603	1543	36.0	39.8	18.9	5.3
50- 99 employees	716	1354	32.6	40.7	21.9	4.8
20- 49 employees	1031	1423	37.1	42.1	16.4	4.4
Under 20 employees	903	1030	39.1	36.2	24.7	0.0
Total	**3699**	**7940**	**32.4%**	**38.5%**	**23.1%**	**6.0%**

Mobile Sand Conditioners

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION	AGE OF UNITS		
			Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	24	150	19.3%	38.6%	14.8%	27.3%
500-999 employees	38	93	25.0	30.0	37.5	7.5
250-499 employees	97	195	27.3	40.2	16.9	15.6
100-249 employees	195	311	32.9	30.5	28.1	8.5
50- 99 employees	175	239	43.1	41.4	10.3	5.2
20- 49 employees	207	252	42.6	44.4	9.3	3.7
Under 20 employees	262	275	31.6	52.6	5.3	10.5
Total	**998**	**1515**	**33.3%**	**40.7%**	**15.8%**	**10.2%**

Portable Sand Conditioners

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION	AGE OF UNITS		
			Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	14	42	12.5%	50.0%	12.5%	25.0%
500-999 employees	42	117	14.3	41.1	42.8	1.8
250-499 employees	99	261	23.4	51.4	24.3	0.9
100-249 employees	229	510	28.2	42.8	25.8	3.2
50- 99 employees	370	769	27.1	58.6	13.8	0.5
20- 49 employees	716	1217	26.1	55.2	16.7	2.0
Under 20 employees	1049	1333	32.6	51.1	16.3	0.0
Total	**2519**	**4249**	**28.0%**	**52.4%**	**18.4%**	**1.2%**

Magnetic Separators

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION	AGE OF UNITS		
			Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	57	461	34.4%	25.4%	25.4%	14.8%
500-999 employees	99	297	26.7	35.6	29.6	8.1
250-499 employees	229	579	28.3	48.4	18.8	4.5
100-249 employees	307	491	49.5	38.1	10.5	1.9
50- 99 employees	244	288	52.8	37.5	8.3	1.4
20- 49 employees	179	192	51.3	28.2	12.8	7.7
Under 20 employees	44	45	33.3	0.0	33.3	33.4
Total	**1159**	**2353**	**38.7%**	**36.2%**	**18.3%**	**6.8%**

Power Riddles

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION	AGE OF UNITS		
			Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	31	154	54.4%	11.4%	32.9%	1.3%
500-999 employees	59	199	19.8	41.7	14.6	23.9
250-499 employees	128	332	19.2	41.1	34.2	5.5
100-249 employees	311	899	14.7	28.9	55.0	1.4
50- 99 employees	526	978	27.5	41.8	28.3	2.4
20- 49 employees	810	1426	20.8	43.4	30.7	5.1
Under 20 employees	1355	1910	25.2	48.0	23.6	3.2
Total	**3220**	**5898**	**23.2%**	**41.4%**	**31.4%**	**4.0%**

Melting and Heat Treating

MELTING furnaces tend to wear out less rapidly than do many other types of foundry equipment. Consequently, among foundries of most size groups the average age of cupolas, air furnaces, open-hearth furnaces and electric arc furnaces is comparatively high. However, this is not true of certain other types of furnaces.

One exception to this longevity is the electric induction furnace. This type unit is of relatively recent development and has found its greatest application to foundry operations within the last ten years. In fact, nearly one-half of the induction furnaces used by foundries were installed during the last five years.

Few Old Crucible Furnaces—Crucible furnaces also have a smaller percentage (9 per cent) of units in the over-20-year bracket than do cupolas (31 per cent), air furnaces (33 per cent) and open-hearth furnaces (67 per cent). Nearly two-thirds of all crucible furnaces were installed during the last ten years. This is about the same proportion as for noncrucible furnaces; in both cases the growth in number and capacity of aluminum casting producers probably has been a contributing factor to the demand for these two types of units.

A third exception is the reverberatory type furnace. Nearly 86 per cent of these units are less than ten years old, and more than half of them have been in service less than five years. An important factor in growing use of this type furnace has been its application for melting iron. In some foundries it supplements the cupola as a source of metal for special heats. Foundries with fewer than 50 employees account for more than 50 per cent of the reverberatory furnaces in use.

As a group the larger foundries were the most active in cupola installations during the last ten years. This reflects capacity expansion and the building of new iron foundries more than it does the replacement of old units. Among the four size groups with more than 100 employees the percentage of cupolas installed the last ten years ranges from 51 to 67 per cent; in the three smallest groups it averages about 35 per cent.

Arc Units Aid Steel Capacity—Relatively few air furnaces and open-hearth furnaces were installed the last five years. Expansion in steel foundry capacity in most cases has been accomplished with electric arc furnaces. About 41 per cent of existing units of the latter type are less than ten years old.

Activity in heat treating equipment since 1949 also has been stimulated by the growth in steel foundry facilities. However, a sizable portion of the heat treating furnaces of smaller shops casting other metals was installed during the same period. Nearly two-thirds of all heat treating furnaces are less than ten years old.

Cupolas

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION AGE OF UNITS: Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	40	233	35.6%	22.2%	17.8%	24.4%
500-999 employees	71	219	25.9	41.1	17.8	15.2
250-499 employees	187	473	20.3	36.3	20.3	23.1
100-249 employees	428	727	20.0	31.5	22.2	26.3
50- 99 employees	625	837	12.6	24.6	25.6	37.2
20- 49 employees	664	871	16.8	17.9	29.6	35.7
Under 20 employees	889	1102	14.1	21.1	29.6	35.2
Total	**2904**	**4462**	**17.6%**	**25.5%**	**25.5%**	**31.4%**

DISTRIBUTION — AGE OF UNITS

Crucible Furnaces

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	21	350	28.3%	35.3%	35.8%	0.6%
500-999 employees	36	659	39.7	16.1	36.8	7.4
250-499 employees	73	709	27.5	27.1	32.7	12.7
100-249 employees	187	1263	22.9	49.0	26.5	1.6
50- 99 employees	316	1847	29.8	38.4	21.3	10.5
20- 49 employees	688	3238	22.3	44.1	26.4	7.2
Under 20 employees	1967	5606	27.5	38.6	22.5	11.4
Total	**3288**	**13672**	**26.8%**	**39.1%**	**25.2%**	**8.9%**

Noncrucible Furnaces

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	3	7				
500-999 employees	9	31	23.8%	50.8%	25.4%	0.0%
250-499 employees	15	107	31.8	25.8	12.1	30.3
100-249 employees	40	186	46.1	7.7	15.4	30.8
50- 99 employees	45	183	54.8	22.6	3.2	19.4
20- 49 employees	75	192	14.6	34.2	30.5	20.7
Under 20 employees	99	482	31.8	45.5	13.6	9.1
Total	**286**	**1188**	**28.6%**	**35.2%**	**19.3%**	**16.9%**

Electric Arc Furnaces

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	30	81	25.0%	12.5%	53.1%	9.4%
500-999 employees	55	126	25.8	21.2	36.3	16.7
250-499 employees	92	234	12.5	23.1	38.5	25.9
100-249 employees	156	314	7.5	23.9	50.7	17.9
50- 99 employees	61	98	15.4	15.4	34.6	34.6
20- 49 employees	108	193	34.2	31.6	26.3	7.9
Under 20 employees	15	15				
Total	**517**	**1061**	**17.7%**	**23.2%**	**40.5%**	**18.6%**

Induction Furnaces

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	10	93	88.9%	2.8%	5.6%	2.7%
500-999 employees	21	72	22.2	38.9	38.9	0.0
250-499 employees	23	90	30.2	32.6	37.2	0.0
100-249 employees	66	194	50.0	11.9	38.1	0.0
50- 99 employees	46	167	56.8	18.2	25.0	0.0
20- 49 employees	52	103	45.4	27.3	27.3	0.0
Under 20 mployees	58	103	42.9	42.8	14.3	0.0
Total	**276**	**822**	**49.6%**	**22.5%**	**27.5%**	**0.4%**

Open-Hearth Furnaces

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	17	69	0.0%	0.0%	26.1%	73.9%
500-999 employees	10	29	5.9	11.8	35.3	47.0
250-499 employees	19	40	0.0	7.1	21.4	71.5
100-249 employees	5	15				
50- 99 employees	2	4				
20- 49 employees	0	0				
Under 20 employees	0	0				
Total	**53**	**157**	**1.5%**	**4.6%**	**26.9%**	**67.0%**

Air Furnaces

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	6	18	6.7%	13.3%	33.3%	46.7%
500-999 employees	26	52	9.7	38.7	29.0	22.6
250-499 employees	31	62	0.0	36.8	26.3	36.9
100-249 employees	42	63	7.7	30.8	19.2	42.3
50- 99 employees	15	24	50.0	50.0	0.0	0.0
20- 49 employees	9	12	0.0	0.0	75.0	25.0
Under 20 employees	8	12				
Total	**137**	**243**	**8.8%**	**31.3%**	**26.7%**	**33.2%**

Reverberatory Furnaces

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	3	11	57.1%	14.3%	28.6%	0.0%
500-999 employees	14	61	33.3	29.2	20.8	16.7
250-499 employees	21	110	16.7	66.7	0.0	16.6
100-249 employees	41	135	55.2	31.0	6.9	6.9
50- 99 employees	53	132	72.7	9.1	0.0	18.2
20- 49 employees	90	229	53.8	28.2	18.0	0.0
Under 20 employees	138	265	60.0	40.0	0.0	0.0
Total	**360**	**943**	**52.4%**	**33.3%**	**9.1%**	**5.2%**

Heat Treating Furnaces

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	59	755	29.9%	11.8%	50.4%	7.9%
500-999 employees	111	933	15.3	30.9	39.4	14.4
250-499 employees	197	934	15.3	31.8	40.3	12.6
100-249 employees	350	974	22.1	36.4	19.9	21.6
50- 99 employees	191	351	42.2	34.5	22.2	1.1
20- 49 employees	278	639	22.0	30.9	43.4	3.7
Under 20 employees	204	480	38.0	31.0	31.0	0.0
Total	**1390**	**5066**	**23.6%**	**29.5%**	**36.0%**	**10.9%**

Materials Handling

PERHAPS no other aspect of foundry operation offers a more fertile field for mechanization than the handling of materials. For each ton of finished castings that they produce, foundries handle about 150 tons of material, and, according to one estimate, they spend nearly $5,000,000 each day to perform that handling.

Results of this study show that foundries have been aware of these facts and that they have acted upon them. Roughly two-thirds of the materials handling products surveyed in the study were acquired since 1944, and about one-third represent post-1949 installations. In addition, from 10 to 26 per cent of the companies reporting expect to order more of each type of equipment surveyed, except hand hoists, for which the figure is 6 per cent.

Seek More Conveyors—For example, although 81 per cent of all roller conveyors are less than ten years old, 23 per cent of the foundries expect to order more. Figures for belt, power mold and monorail conveyors reveal a similar situation. More than 70 per cent of each are under ten years old, and each is expected to be ordered by a substantial percentage of the firms surveyed.

The cupola is the meeting place for a considerable proportion of the materials used by foundries, with coke, limestone, scrap and pig iron finding their way into its maw. Many foundries have given up manual charging since 1944; 77 per cent of the cupola charger installations reported were made after that date.

A Lot Moves Overhead—The acquisition rate for overhead cranes is lower, but still impressive; 57 per cent are not yet ten years old. The number of these units in use also is worthy of notice. There are an indicated 15,658 in the industry. Obviously, cranes do a lot of foundry handling jobs satisfactorily.

The survey reports on three types of hoists—electric, air and hand. Over 70 per cent of each type date after 1944, electric hoists heading the other two with nearly 80 per cent.

Gas and electric trucks also have been acquired in large numbers in recent years. Gas trucks in particular are recent acquisitions, for 52.6 per cent are less than five years old, and 89.8 are less than ten.

Roller Conveyors

DISTRIBUTION			AGE OF UNITS			
SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	49	1094	40.8%	31.2%	17.4%	10.6%
500-999 employees	88	1634	11.6	60.2	28.2	0.0
250-499 employees	197	1877	27.9	49.6	20.1	2.4
100-249 employees	307	2854	25.8	58.9	11.7	3.6
50- 99 employees	259	1915	41.4	33.0	25.1	0.5
20- 49 employees	358	2040	23.0	71.4	5.6	0.0
Under 20 employees	408	1370	54.9	32.9	12.2	0.0
Total	**1666**	**12784**	**30.6%**	**50.8%**	**16.6%**	**2.0%**

Belt Conveyors

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	57	2316	31.0%	27.6%	31.0%	10.4%
500-999 employees	90	1228	30.9	39.2	27.4	2.5
250-499 employees	187	1434	24.8	46.1	21.5	7.6
100-249 employees	245	1061	41.0	43.3	15.2	0.5
50- 99 employees	179	408	44.1	47.1	8.8	0.0
20- 49 employees	146	301	48.4	34.4	6.3	10.9
Under 20 employees	102	144	55.6	44.4	0.0	0.0
Total	**1006**	**6892**	**33.3%**	**37.8%**	**22.9%**	**6.0%**

Power Mold Conveyors

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	43	361	22.1%	32.5%	31.8%	13.6%
500-999 employees	53	239	13.8	69.0	11.2	6.0
250-499 employees	84	224	23.5	39.2	25.5	11.8
100-249 employees	101	333	43.7	31.0	18.3	7.0
50- 99 employees	19	88	69.6	30.4	0.0	0.0
20- 40 employees	28	61	53.8	7.7	23.1	15.4
Under 20 employees	58	117	66.7	33.3	0.0	0.0
Total	**386**	**1423**	**34.0%**	**38.2%**	**19.3%**	**8.5%**

Monorail Conveyors

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	50	522	33.9%	31.5%	29.7%	4.9%
500-999 employees	73	286	29.7	42.4	26.1	1.8
250-499 employees	157	541	34.9	43.2	16.2	5.7
100-249 employees	245	691	35.1	43.5	15.6	5.8
50- 99 employees	210	415	22.8	55.4	16.8	5.0
20- 49 employees	325	683	30.9	30.9	32.5	5.7
Under 20 employees	379	504	50.0	25.0	21.4	3.6
Total	**1439**	**3642**	**34.3%**	**38.1%**	**22.7%**	**4.9%**

Cupola Chargers

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	36	133	45.0%	26.7%	15.0%	13.3%
500-999 employees	52	94	27.6	44.8	20.7	6.9
250-499 employees	115	186	23.0	47.5	19.7	9.8
100-249 employees	191	219	32.8	37.9	8.6	20.7
50- 99 employees	210	251	42.6	41.0	9.8	6.6
20- 49 employees	132	160	31.2	53.1	9.4	6.3
Under 20 employees	117	117	57.1	28.6	0.0	14.3
Total	**853**	**1160**	**36.8%**	**40.4%**	**11.4%**	**11.4%**

Cranes

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	57	2462	34.9%	17.5%	20.9%	26.7%
500-999 employees	115	1858	16.0	24.0	28.2	31.8
250-499 employees	248	2788	16.8	27.9	31.4	23.9
100-249 employees	471	2730	27.3	29.3	20.6	22.8
50- 99 employees	549	2421	27.4	34.6	23.2	14.8
20- 49 employees	688	1577	34.4	30.7	25.6	9.3
Under 20 employees	1020	1822	28.9	39.7	23.8	7.6
Total	**3148**	**15658**	**26.8%**	**28.7%**	**24.1%**	**20.3%**

Electric Hoists

DISTRIBUTION / AGE OF UNITS

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	54	2279	31.5%	37.1%	25.9%	5.5%
500-999 employees	101	1496	36.7	37.8	23.7	1.8
250-499 employees	225	2613	21.8	52.2	19.6	6.4
100-499 employees	463	2949	36.7	44.4	15.9	3.0
50- 99 employees	610	2651	47.4	38.2	12.3	2.1
20- 49 employees	805	2111	44.8	44.6	9.6	1.0
Under 20 employees	932	1613	36.3	49.4	12.1	2.2
Total	**3190**	**15712**	**36.3%**	**43.5%**	**16.9%**	**3.3%**

Air Hoists

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	57	4480	33.8%	37.9%	16.2%	12.1%
500-999 employees	97	1722	40.4	34.1	21.8	3.7
250-499 employees	193	2817	26.1	43.2	25.1	5.6
100-249 employees	331	1901	41.9	40.0	15.4	2.7
50- 99 employees	339	1362	38.1	42.5	17.3	2.1
20- 49 employees	367	907	54.7	24.3	12.2	8.8
Under 20 employees	219	378	50.0	38.5	7.7	3.8
Total	**1603**	**13567**	**36.5%**	**38.4%**	**18.2%**	**6.9%**

Hand Hoists

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	33	1329	36.6%	28.8%	27.8%	6.8%
500-999 employees	73	723	23.3	38.7	22.3	15.7
250-499 employees	145	1301	20.6	35.6	40.1	3.7
100-249 employees	292	1508	34.5	46.7	14.8	4.0
50- 99 employees	438	1766	31.4	47.5	14.3	6.8
20- 49 employees	707	2113	29.4	38.2	29.1	3.3
Under 20 employees	1268	2357	33.6	46.2	17.7	2.5
Total	**2956**	**11097**	**30.7%**	**41.2%**	**23.1%**	**5.0%**

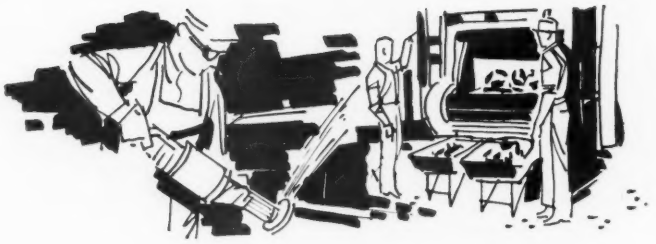
Electric Trucks

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	49	578	43.1%	31.1%	21.4%	4.4%
500-999 employees	94	665	29.3	40.8	22.5	7.4
250-499 employees	155	691	39.4	41.4	17.2	2.0
100-249 employees	202	610	27.3	55.2	14.0	3.5
50- 99 employees	137	297	51.4	30.5	15.3	2.8
20- 49 employees	66	80	23.5	41.2	29.4	5.9
Under 20 employees	87	87	33.3	33.3	0.0	33.4
Total	**790**	**3008**	**36.0%**	**40.8%**	**18.2%**	**5.0%**

Gas Trucks

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	51	866	44.1%	31.5%	18.9%	5.4%
500-999 employees	101	749	43.8	42.4	13.8	0.0
250-499 employees	202	1194	45.5	44.4	9.9	0.2
100-249 employees	416	1282	61.0	34.2	3.1	1.7
50- 99 employees	430	831	60.0	36.3	3.7	0.0
20- 49 employees	358	565	59.0	28.4	11.9	0.7
Under 20 employees	248	289	58.8	41.2	0.0	0.0
Total	**1806**	**5776**	**52.6%**	**37.2%**	**9.0%**	**1.2%**

Cleaning and Finishing



DURING the last ten years foundries frequently found that their cleaning room capacity was inadequate to match the increased production provided in molding and melting departments. As a consequence, considerable new equipment was installed for preparing castings for shipment.

A factor in speeding up the movement of castings to the cleaning room has been increased use of mechanical shakeouts. About 2500 of such units were installed since 1944, this figure representing more than 80 per cent of existing units. Small foundries have been particularly active the last five years in acquiring such equipment.

The Mills Still Tumble—Despite the growing popularity of other types of cleaning equipment, tumbling mills still outnumber airless blast and pneumatic blast units both in number of users and in amount of equipment used. Nearly 43 per cent of the 6800 existing tumbling mills were acquired the last ten years, but some 1500 of the total are more than 20 years old.

Most tumbling mills are to be found among the smaller foundries, plants with fewer than 100 employees operating approximately 4000 units.

Airless blast machines in service total about 3500, compared with 2700 pneumatic blast units, according to this survey. More than three-fourths of the airless units were installed since 1944, and 29 per cent of them since 1949. Smaller foundries have been somewhat more active than larger companies in installing this equipment the last ten years. This is also true of their purchases of pneumatic blast units.

Nearly 60 per cent of all air blast rooms and cabinets have been acquired since 1944; in the case of foundries with less than 50 employees the proportion is more than 70 per cent. Nearly 11 per cent of all pneumatic blast units are more than 20 years old.

Grinding Is Extensive—Grinding operations in foundries require the use of nearly 45,000 individual floor stand, swing frame and portable grinders. The portable type comprises more than one-half the total. Swing frame and floor stand grinders tend to be long lived, as indicated by the fact that 37 per cent of the former and 35 per cent of the latter in service today are more than ten years old. On the other hand, less than 14 per cent of the portable grinders are in that age bracket.

Large proportions of the industry's cut-off machines and metal cutting band saws have been installed in recent years. More than 82 per cent of the cut-off units are less than 10 years old, and approximately one-half of them are operated by foundries with less than 50 employees. These same size foundries account for nearly 65 per cent of the metal cutting band saws, and about 70 per cent of these units have been installed since 1944.

Pneumatic chipping hammers show an age experience remarkably similar to that of portable grinders. In both cases the percentages of total units under five years old, five to ten years old and more than ten years old are practically identical. Approximately 31,600 chipping hammers are in service, and the 852 largest foundries account for more than half of them.

Welding and Cutting—Foundries employ some 6600 electric welding units, four-fifths of which have been acquired the last ten years. While welding is practiced extensively by steel foundries, and nearly 23 per cent of all machines are distributed among the 59 largest foundries, a sizable number —1095—are in the 2500 smallest foundries.

Only 15 per cent of the 6300 gas welding and flame cutting units are operated by the largest foundries, compared with 24 per cent by the smallest foundries. Both gas and electric welding equipment is fairly modern; 55 per cent of the former and 37 per cent of the latter units were bought within the last five years.

Vibrating Shakeouts

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION: Under 5 Years	5 to 10 Years	10 to 20 Years	AGE OF UNITS: Over 20 Years
Over 1000 employees	59	813	43.1%	28.3%	26.1%	2.5%
500-999 employees	109	474	39.7	44.9	15.0	0.4
250-499 employees	233	645	31.0	45.9	20.3	2.8
100-249 employees	334	579	33.3	52.3	12.1	2.3
50- 99 employees	232	300	53.2	35.1	10.4	1.3
20- 49 employees	202	228	40.8	46.9	10.2	2.1
Under 20 employees	131	174	70.0	20.0	10.0	0.0
Total	**1300**	**3213**	**40.6%**	**40.1%**	**17.3%**	**2.0%**

Tumbling Mills

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION: Under 5 Years	5 to 10 Years	10 to 20 Years	AGE OF UNITS: Over 20 Years
Over 1000 employees	46	409	13.5%	15.2%	7.8%	63.5%
500-999 employees	71	411	20.9	33.0	32.1	14.0
250-499 employees	147	841	11.3	23.2	34.8	30.7
100-249 employees	350	1176	10.9	32.3	37.1	19.7
50- 99 employees	488	1043	14.1	31.6	34.7	19.6
20- 49 employees	673	1287	12.0	26.9	46.1	15.0
Under 20 employees	1224	1641	15.6	32.1	32.1	20.2
Total	**2999**	**6808**	**13.5%**	**29.2%**	**35.1%**	**22.2%**

Pneumatic Chippers

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION: Under 5 Years	5 to 10 Years	10 to 20 Years	AGE OF UNITS: Over 20 Years
Over 1000 employees	57	6893	50.5%	34.1%	15.1%	0.3%
500-999 employees	115	4555	50.4	30.4	18.6	0.6
250-499 employees	229	5459	45.6	41.9	12.1	0.4
100-249 employees	486	5334	46.3	44.6	8.3	0.8
50- 99 employees	663	4070	46.1	39.8	14.0	0.1
20- 49 employees	862	2964	50.8	40.9	7.1	1.2
Under 20 employees	991	2368	41.7	36.4	19.9	2.0
Total	**3403**	**31643**	**47.7%**	**38.2%**	**13.4%**	**0.7%**

Swing Frame Grinders

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION: Under 5 Years	5 to 10 Years	10 to 20 Years	AGE OF UNITS: Over 20 Years
Over 1000 employees	49	325	17.9%	22.4%	49.2%	10.5%
500-999 employees	78	414	29.5	24.4	37.3	8.8
250-499 employees	157	522	13.6	39.5	36.6	10.3
100-249 employees	241	533	23.3	56.0	17.2	3.5
50- 99 employees	194	274	33.3	42.0	23.2	1.5
20- 49 employees	198	255	32.0	44.0	24.0	0.0
Under 20 employees	189	218	25.0	41.7	33.3	0.0
Total	**1106**	**2541**	**23.7%**	**39.2%**	**31.3%**	**5.8%**

Floor Stand Grinders

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	57	1425	31.6%	28.3%	26.7%	13.4%
500-999 employees	122	1187	16.0	34.7	38.5	10.8
250-499 employees	246	1825	14.6	35.2	37.0	13.2
100-249 employees	556	2681	24.1	48.1	19.4	8.4
50- 99 employees	731	2582	20.3	44.5	26.4	8.8
20- 49 employees	1154	3000	20.7	49.0	23.2	7.1
Under 20 employees	2098	3797	18.1	49.8	22.8	9.3
Total	**4964**	**16497**	**20.5%**	**44.0%**	**25.9%**	**9.6%**

Portable Grinders

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	45	5335	45.3%	35.7%	19.0%	0.0%
500-999 employees	94	3287	38.0	44.6	16.9	0.5
250-499 employees	210	3942	40.6	41.9	17.3	0.2
100-249 employees	451	4346	49.9	41.6	7.7	0.8
50- 99 employees	636	3595	50.9	36.2	12.9	0.0
20- 49 employees	914	2468	53.8	37.3	8.3	0.6
Under 20 employees	1544	2811	49.7	43.5	5.0	1.8
Total	**3894**	**25784**	**46.5%**	**39.8%**	**13.2%**	**0.5%**

Cut-Off Machines

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	26	60	71.4%	17.9%	10.7%	0.0%
500-999 employees	57	112	40.5	42.8	16.7	0.0
250-499 employees	84	229	23.5	36.3	33.3	6.9
100-249 employees	167	242	38.9	42.6	11.1	7.4
50- 99 employees	202	281	38.8	44.8	14.9	1.5
20- 49 employees	405	485	33.0	45.4	20.6	1.0
Under 20 employees	583	653	48.7	43.6	7.7	0.0
Total	**1524**	**2062**	**39.9%**	**42.5%**	**15.5%**	**2.1%**

Metal Cutting Band Saws

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	47	171	34.4%	24.5%	31.1%	10.0%
500-999 employees	90	218	23.8	48.5	24.7	3.0
250-499 employees	168	356	25.8	47.7	19.4	7.1
100-249 employees	311	539	40.3	41.1	16.3	2.3
50- 99 employees	377	570	32.9	45.4	16.8	4.9
20- 49 employees	721	1095	22.6	48.4	15.4	13.6
Under 20 employees	1777	2258	33.1	33.9	22.3	10.7
Total	**3491**	**5207**	**30.8%**	**40.2%**	**19.8%**	**9.2%**

Airless Blast Units

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	47	296	35.9%	33.8%	26.1%	4.2%
500-999 employees	94	343	21.9	44.4	32.5	1.2
250-499 employees	197	524	19.6	52.7	26.8	0.9
100-249 employees	408	715	31.5	45.5	21.8	1.2
50- 99 employees	457	626	31.8	49.7	15.9	2.6
20- 49 employees	584	648	30.6	50.0	19.4	0.0
Under 20 employees	408	409	30.8	50.0	15.4	3.8
Total	**2195**	**3561**	**29.0%**	**47.5%**	**21.7%**	**1.8%**

Pneumatic Blast Units

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	37	160	38.8%	15.0%	38.7%	7.5%
500-999 employees	88	168	11.8	38.7	39.8	9.7
250-499 employees	160	338	15.7	35.0	36.4	12.9
100-249 employees	268	472	20.4	31.6	29.6	18.4
50- 99 employees	331	428	18.7	29.0	36.4	15.9
20- 49 employees	452	566	23.4	48.6	22.4	5.6
Under 20 employees	554	581	25.7	45.7	22.9	5.7
Total	**1890**	**2713**	**21.8%**	**37.6%**	**29.8%**	**10.8%**

Electric Welding Machines

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	57	1502	30.5%	27.2%	38.5%	3.8%
500-999 employees	97	730	42.1	40.6	16.7	0.6
250-499 employees	212	981	32.8	42.4	22.2	2.6
100-249 employees	405	886	37.0	49.1	13.9	0.0
50- 99 employees	469	750	38.1	50.0	10.7	1.2
20- 49 employees	556	673	47.0	45.4	7.6	0.0
Under 20 employees	830	1095	41.2	50.0	5.9	2.9
Total	**2626**	**6617**	**37.3%**	**42.1%**	**18.7%**	**1.9%**

Gas Welding, Cutting Units

SIZE OF FOUNDRY	Number of Foundries	Number of Units	Under 5 Years	5 to 10 Years	10 to 20 Years	Over 20 Years
Over 1000 employees	49	942	54.0%	35.2%	10.8%	0.0%
500-999 employees	94	548	61.5	33.6	4.9	0.0
250-499 employees	197	873	41.8	44.1	12.5	1.6
100-249 employees	393	947	60.0	31.9	8.1	0.0
50- 99 employees	484	760	52.4	42.2	4.8	0.6
20- 49 employees	608	748	49.0	41.9	9.1	0.0
Under 20 employees	962	1490	61.4	30.7	7.9	0.0
Total	**2787**	**6308**	**54.8%**	**36.4%**	**8.5%**	**0.3%**

Miscellaneous Equipment

ABOUT one-fourth of all foundries use some kind of physical testing equipment such as tensile or hardness testing units. However, a wide variation is shown in use of such equipment among different size foundries.

Among the 450 largest foundries, comprising less than 8 per cent of all plants, 43 per cent of all testing units are employed. Only 22 per cent of the equipment is distributed among the 3900 smallest foundries, which represent 67 per cent of the industry's individual shops. More than 80 per cent of the 450 largest foundries do physical testing work, while less than 9 per cent of the 3900 smallest ones are so engaged. Nearly 75 per cent of all physical testing units have been purchased since 1944, and more than one-third of them have been acquired the last five years.

Radiography Use Grows—X-ray equipment has come to mean more than a supplement to the inspection operation; it is also being used as an effective means of looking inside castings to analyze the cause of possible defects and suggest methods of improving casting design and gating practice. Increased use of x-ray technique in recent years reflects its growing application for this purpose as well as routine inspection.

About 80 per cent of the x-ray equipment now in use has been purchased since 1944 and about 50 per cent has been employed since 1949. Approximately four-fifths of the units are in plants with more than 100 employees. Slightly more than 50 per cent of the 59 largest plants do x-ray work. One-third of the 500-999-employee group have x-ray units, while the proportion drops to one-fourth for plants in the 250-499 bracket and to one-tenth in the 100-249 group.

Cleaning Up the Air—Emphasis in recent years on better housekeeping to provide improved working conditions and more healthful surroundings, plus increased use of mechanical shakeouts, have been factors in the installation of additional exhaust, ventilation and dust arresting equipment. Today nearly 67 per cent of all foundries are equipped with some kind of exhaust and ventilation fans. In the case of the largest foundries, the application is nearly 100 per cent. Of this equipment, nearly 80 per cent is less than ten years old, while less than 3 per cent was acquired prior to 20 years ago.

Various types of dust arrestors are in use, but the bag type unit is the most popular from the standpoint of numbers, followed by the mechanical and the wet types. Foundries employing more than 100 persons have nearly 50 per cent of the bag type, about 90 per cent of the wet type and approximately 45 per cent of the mechanical type arrestors currently in use.

About 70 per cent of all dust arrestors have been installed within the last ten years.

Physical Testing Units

SIZE OF FOUNDRY	DISTRIBUTION: Number of Foundries	DISTRIBUTION: Number of Units	AGE OF UNITS: Under 5 Years	AGE OF UNITS: 5 to 10 Years	AGE OF UNITS: 10 to 20 Years	AGE OF UNITS: Over 20 Years
Over 1000 employees	53	311	49.1%	16.4%	29.2%	5.3%
500-999 employees	107	312	32.7	26.6	30.7	10.0
250-499 employees	225	435	20.7	45.2	28.5	5.6
100-249 employees	354	536	31.1	44.3	20.5	4.1
50- 99 employees	267	322	36.7	32.9	24.1	6.3
20- 49 employees	198	389	45.7	45.7	4.9	3.7
Under 20 employees	146	146	44.4	55.6	0.0	0.0
Total	**1350**	**2451**	**35.6%**	**38.1%**	**21.1%**	**5.2%**

X-Ray Machines

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION Under 5 Years	5 to 10 Years	10 to 20 Years	AGE OF UNITS Over 20 Years
Over 1000 employees	31	49	43.5%	26.1%	30.4%	0.0%
500-999 employees	40	73	53.3	13.3	33.4	0.0
250-499 employees	65	71	31.0	44.8	24.2	0.0
100-249 employees	58	62	69.2	23.1	7.7	0.0
50- 99 employees	27	27	57.1	42.9	0.0	0.0
20- 49 employees	42	56	50.0	33.3	16.7	0.0
Under 20 employees	0	0				
Total	**263**	**338**	**49.8%**	**29.4%**	**20.8%**	**0.0%**

Ventilating Fans

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION Under 5 Years	5 to 10 Years	10 to 20 Years	AGE OF UNITS Over 20 Years
Over 1000 employees	55	5725	48.8%	23.7%	19.4%	8.1%
500-999 employees	120	2683	36.8	34.4	26.6	2.2
250-499 employees	231	4230	22.8	45.5	28.7	3.0
100-240 employees	510	5503	45.7	41.7	10.5	2.1
50- 99 employees	667	3954	42.6	41.7	14.4	1.3
20- 49 employees	966	4277	44.9	41.6	13.2	0.3
Under 20 employees	1355	3252	34.9	55.2	9.9	0.0
Total	**3904**	**29624**	**40.6%**	**39.6%**	**17.0%**	**2.8%**

Bag Type Dust Arrestors

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION Under 5 Years	5 to 10 Years	10 to 20 Years	AGE OF UNITS Over 20 Years
Over 1000 employees	50	254	31.0%	19.0%	31.0%	19.0%
500-999 employees	95	303	24.3	28.6	42.1	5.0
250-499 employees	212	873	20.6	40.5	31.9	7.0
100-249 employees	490	1005	25.1	36.8	29.4	8.7
50- 99 employees	526	862	31.6	40.1	23.6	4.7
20- 49 employees	612	790	24.7	49.4	21.1	4.8
Under 20 employees	510	657	30.6	55.5	13.9	0.0
Total	**2495**	**4744**	**26.4%**	**41.3%**	**26.2%**	**6.1%**

Wet Type Dust Arrestors

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION Under 5 Years	5 to 10 Years	10 to 20 Years	AGE OF UNITS Over 20 Years
Over 1000 employees	46	602	52.3%	28.5%	19.2%	0.0%
500-999 employees	80	382	29.9	40.8	29.3	0.0
250-499 employees	147	393	37.2	50.6	12.2	0.0
100-249 employees	144	259	38.7	45.2	16.1	0.0
50- 99 employees	91	122	62.5	28.1	6.3	3.1
20- 49 employees	75	98	40.0	55.0	5.0	0.0
Under 20 employees	15	15				
Total	**598**	**1871**	**42.6%**	**39.4%**	**17.8%**	**0.2%**

Mechanical Dust Arrestors

SIZE OF FOUNDRY	Number of Foundries	Number of Units	DISTRIBUTION Under 5 Years	5 to 10 Years	10 to 20 Years	AGE OF UNITS Over 20 Years
Over 1000 employees	44	325	53.1%	6.3%	34.4%	6.2%
500-999 employees	55	226	19.8	24.2	56.0	0.0
250-499 employees	92	293	19.5	46.1	32.8	1.6
100-249 employees	136	216	26.9	40.4	25.0	7.7
50- 99 employees	210	364	30.8	39.4	24.5	5.3
20- 49 employees	391	508	45.0	43.1	11.0	0.9
Under 20 employees	321	411	31.8	50.0	18.2	0.0
Total	**1249**	**2343**	**34.3%**	**36.9%**	**26.0%**	**2.8%**

EQUIPMENT for the

SMALL foundries—those employing 50 or less—can benefit greatly from the use of labor-saving equipment designed either for direct production work or for handling materials in process. No foundry is too small, despite much comment to the contrary, to take advantage of the many types of available equipment.

To be mechanized the small shop does not need miles of conveyors, batteries of pushbutton molding machines, three or four automatic mulling units, and a host of other equipment in the larger sizes or capacities. Most of the equipment used widely in large, highly mechanized foundries is adaptable either in the same sizes or smaller models to small foundry usage.

Early Benefits Are Greatest—Small foundries benefit from initial installations of labor-saving equipment as much as and often more than do some of the larger foundries which already have achieved a measure of mechanization. Early applications of machines and equipment achieve relatively greater benefit in terms of: (1) labor and cost savings, (2) product uniformity, (3) product quality, and (4) worker efficiency and morale than do later installations when somewhat advanced levels of production and quality already have been attained. In other words, a walking man generally increases his speed more when he first starts to run than he does when he tries to run faster.

With industry facing more competitive conditions, many small foundry operators are seeking ways to reduce costs and improve quality. One

Molding

1—Bench ramming, practiced in many foundries, is facilitated by this Ingersoll-Rand Co. 12-lb pneumatic rammer. The tool is designed for operation on 80 to 100 psi air pressure and employs the reciprocating principle of power. However, the piston is connected directly to the ramming butt, allowing the operator to control closely the ramming effect of the tool.

2—Labor-saving devices are attractions of this Osborn Mfg. Co. molding machine which jolts, rolls, squeezes, draws and closes large molds made from matchplate patterns. The illustration shows the machine in a malleable foundry making molds in a 15 x 30-in. flask with 5-in. drag and 6-in. cope. Formerly two men working on a bench produced 30 to 40 molds per day. Now one man with the machine turns out 80 to 90 a day. Principal feature of the machine is the rollover device, consisting of two arms which engage split trunnions on

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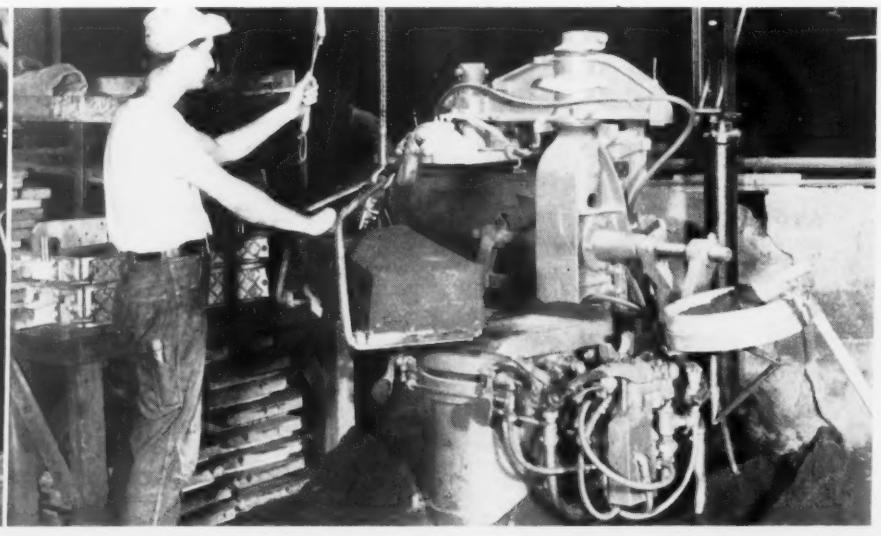

Small Foundry

Material presented on this and the following pages was submitted by many equipment manufacturers whose advertisements appear regularly in FOUNDRY. A total of 135 pieces of production, materials handling and related equipment applicable to the needs of foundries employing 50 or less people is described. The article is divided into seven sections: Molding, coremaking, sand conditioning, yard work and furnace charging, melting and pouring, shakeout and cleaning, and related equipment. The latter section includes air compressors, heat treating ovens, and exhaust and dust collection systems.

logical step is in the direction of mechanization, based on an over-all, integrated plan for the entire foundry operation.

Plan Should Be Flexible—Primarily the plan should serve present needs of the shop and still have the necessary flexibility to meet changing production schedules. Every piece of equipment purchased should fit into the plan, even though the individual units are acquired at irregular intervals. The result will be an integrated and balanced system of production and handling units for the continuous processing of materials.

Equipment manufacturers, aware of the fact that over 67 per cent of all foundries in the United States and Canada employ less than 50 people and that over 45 per cent employ less than 20, recognize the needs of the smaller shops. For years they have offered a wide variety of equipment designed specifically for these foundries and currently are expanding their efforts in the development of new units for that market.

Many of the equipment items finding application in the small foundry are described on this and following pages.

the flasks to raise them off the table so that they may be rotated easily. Besides permitting the handling of larger molds this rollover device makes possible the production of both cope and drag on one machine.

3—The automatic shell molding machine and shell bonding fixture of Shell Process Inc. permits one man to produce the shells and close them ready for pouring. Since back-up material, weights or supports for the molds are unnecessary, according to the manufacturer, a materials handling problem is eliminated. For the presently unmechanized small foundry these matched units are said to permit production runs of shell castings with low labor cost and minimum capital investment.

4—Simple and effective speed control is achieved in alternating current electric hoists of Detroit Hoist & Machine Co. by the multispeed principle which utilizes a motor with two windings. Two definite speeds thus obtained have a ratio of approximately 3:1, low speed being used only for accurate locating and setting. Both speeds are controlled by a common two-station pushbutton or by a rope controller as illustrated. This type of hoist is made in capacities from ½ to 10 tons. Single-speed hoists for general handling are offered as are

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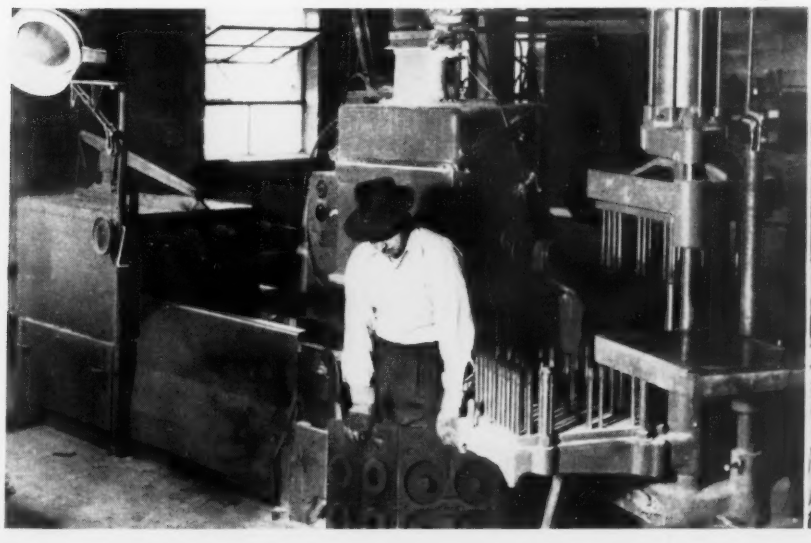

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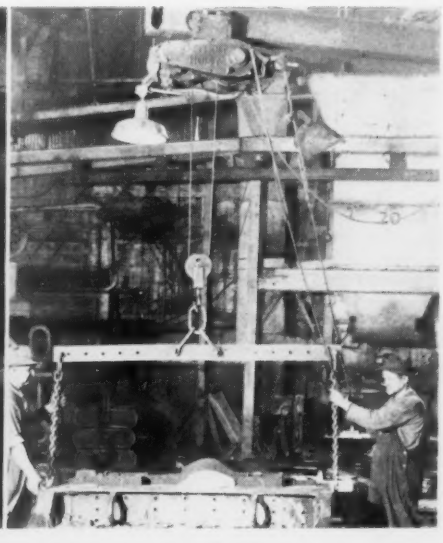

pneumatic hoists which provide variable speed range for foundry work in capacities from ½ to 10 tons.

5—Flasks are standard equipment in almost every sand foundry. Those shown here, manufactured by Sterling Wheelbarrow Co., are made of a continuous piece of special rolled channel steel welded at the joint. Double pin lugs welded to the flasks ⅛-in. from the parting edge permit the sections to be stacked for multiple molding if desired. Flat steel handles are welded at the reinforcing rib in the center of each section. Optional handles are single looped steel rod or double handles of tubular steel for two-man lift. Various types of pins and several sizes and styles of flasks are available.

6—This Thor Power Tool Co. pneumatic rammer for floor work is available with a round plunger or a concave plunger which prevents the butt from rotating. The latter is for use where mold reinforcements necessitate guiding the narrow width of a pein between closely spaced bars. The tool has an over-all length of 48⅝-in., weighs 25 lb and may be equipped with a variety of butt and pein sizes.

7—Jolt-squeeze pin-lift molding machines often are the backbone of a small foundry. Outstanding feature of the new machine offered by Beardsley & Piper Division, Pettibone Mulliken Corp., is its concentric pattern draw cylinder. The lifting pin frame is mounted on a concentric air cylinder which surrounds completely the jolt and squeeze cylinders. Such construction makes possible an accurate draw and permits the small foundry to handle molding work requiring the highest degree of accuracy. The machine has a 6-in. pattern draw and a 600-lb capacity. Other features include a simplified control mechanism with two controls for all operations of the machine, and a quickly adjustable swing-aside mold clamp. The machine is available in a wide range of capacities.

8—The combination jolt and power squeeze molding machine made by Wm. H. Nicholls Co. operates on air pressure of 80 psi and features an air connection at top of the column, eliminating complicated piping. The unit is designed to handle a maximum flask size of 12 x 16 in. It has a jolt capacity of 300 lb; a standard distance between squeeze head and table of 10 to 18 in., and a squeeze piston 10½ in. long. The same machine is available mounted on wheels for portability.

9—Among the many flasks that Hines Flask Co. develops for special applications is the split trun-

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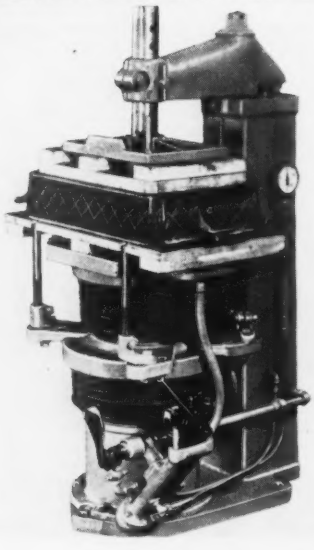

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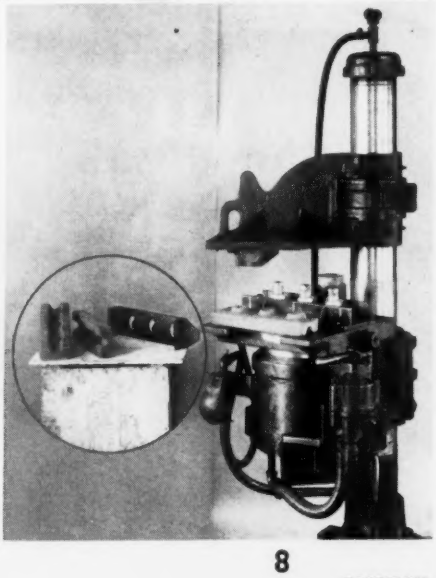

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nion type used with the molding machine previously described. It was adapted from a standard type pop-off flask. Hines makes only cast aluminum flasks and jackets, which are strengthened with diagonal ribs and, in the case of flasks, are reinforced at the parting line. All units are fixture-built to extreme accuracy.

10—Jolt-ram, power pin-lift machines by International Molding Machine Co. are equipped with vibrator, cleaner valve and automatic lubrication. Featured in the machine are two jolt sections combined in one integral part to give a positive ram throughout the mold. Lifting section is guided by hardened steel parts, and valves are located conveniently for ease of operation. Machines are available in capacities from 600 to 3000 lb with a draw of 8 to 12 in., varying with the model capacity.

11—Versatility of the Davenport Machine & Foundry Co. hinge type rollover and companion stripper machines has appealed to operators of foundries employing from 20 to 50 men. The units shown, rollover in foreground and stripper at rear, have 1000-lb capacity and will handle flasks ranging from 14 x 16 in. to 26 x 42 in. Both machines are air operated and in most cases can be manned by unskilled labor.

12—Roller conveyors such as made by Logan Co. come in a wide range of sizes and types with accessory equipment, and are adaptable to large and small foundries. They form an ideal connecting link between molding, pouring, cooling and shakeout operations. Similar lines can serve coremaking or cleaning, chipping and grinding sections. Length and spacing of rolls can be varied to suit large or small molds, and capacities cover a wide range. In the installation pictured a roller bed transfer car

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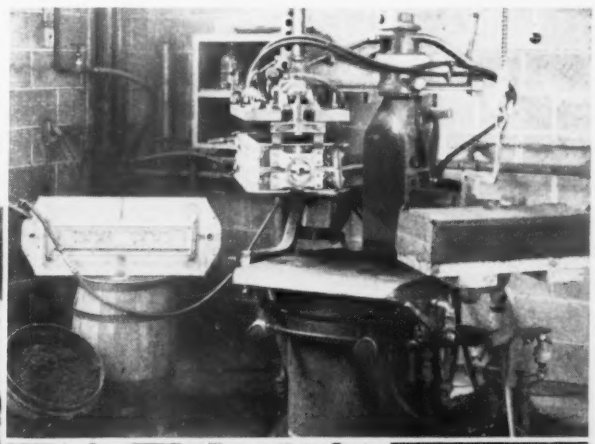

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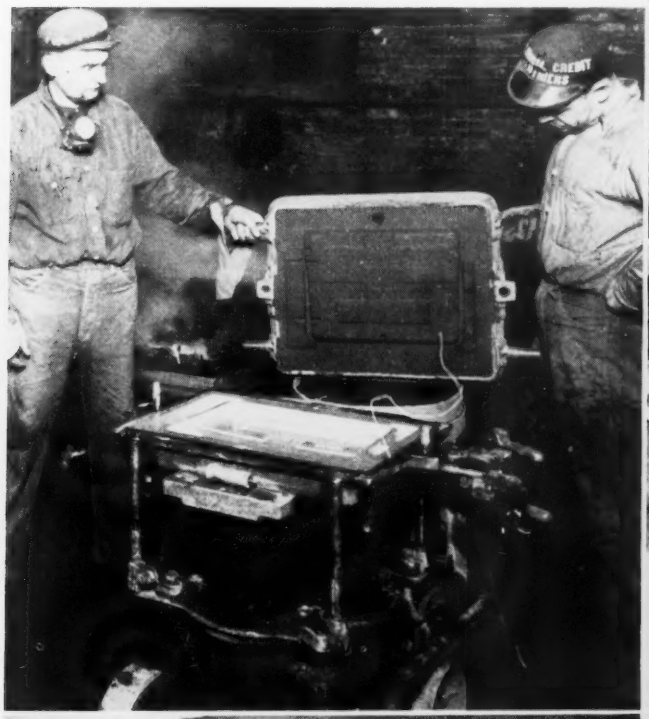

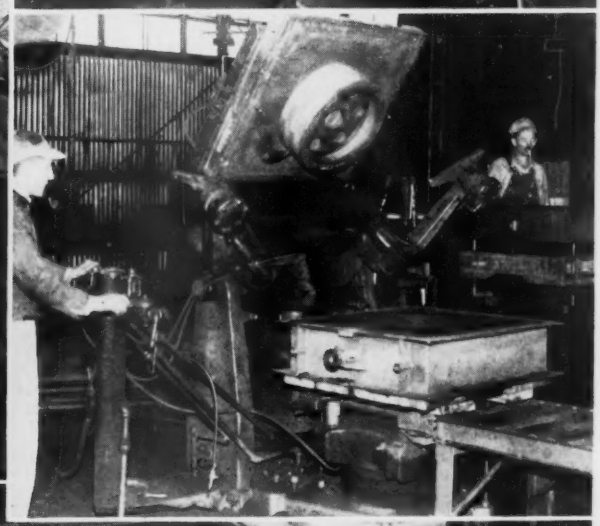

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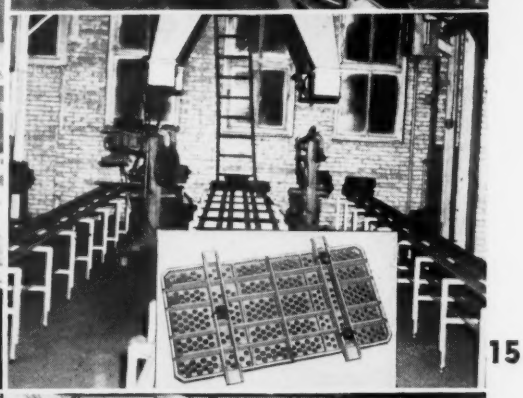

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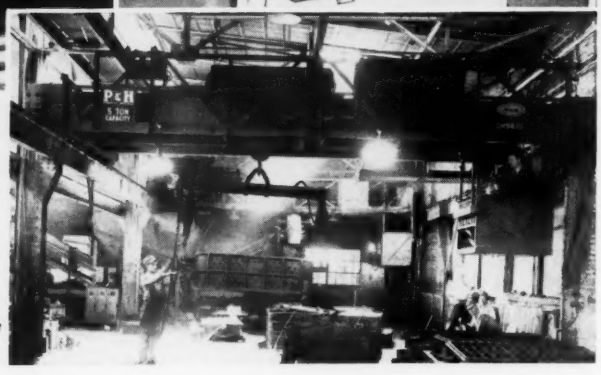

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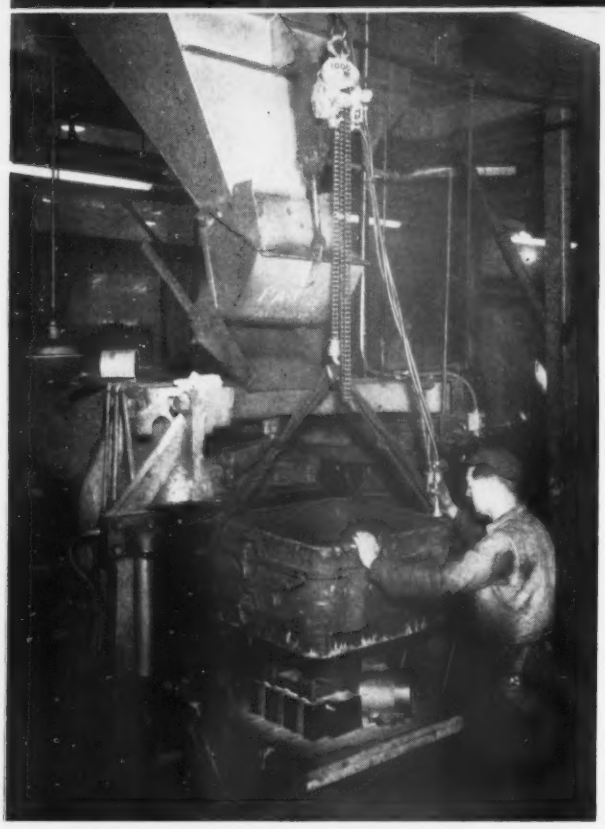

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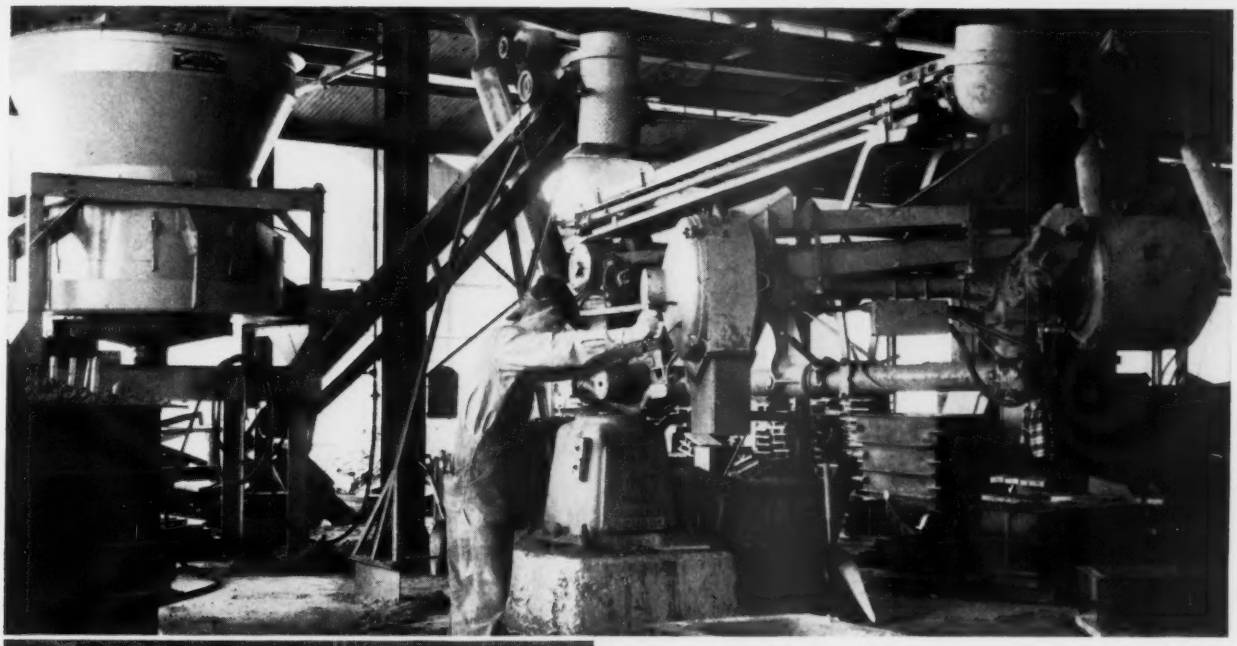
carries molds from molders to roller conveyor pouring lines and then to shakeout, returning empty flasks to the molders.

13—Use of switch sections in a gravity roller conveyor system installed by Standard Conveyor Co. provides a mold assembly line in an electric steel foundry. The switching section, which pivots at lower right, is shown in the foreground. Rollers on these conveyors are equipped with grease-sealed bearings. Spillage of hot metal is guarded against by special steel shields. These convex shaped shields fit into the ends of rollers to repel foreign matter. An exit for small particles is provided by an opening at bottom of shield.

14—The charging conveyor type rollover draw machine made by Herman Pneumatic Machine Co.



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can be used for either molds or cores. Flasks are rammed at a separate station by hand, jolt machine or sandslinger and conveyed on gravity rolls to this machine. No lift is necessary. The assembly is clamped, rolled over, drawn and the completed mold or core deposited directly on the discharge conveyor. The pattern or corebox is rolled back, unclamped, and removed either to storage or to the ramming station. The rollover draw machine is built in sizes and capacities varying from 750 to 20,000 lb. Because of its design and clamping method, each machine will handle a wide range of mold sizes and weights.

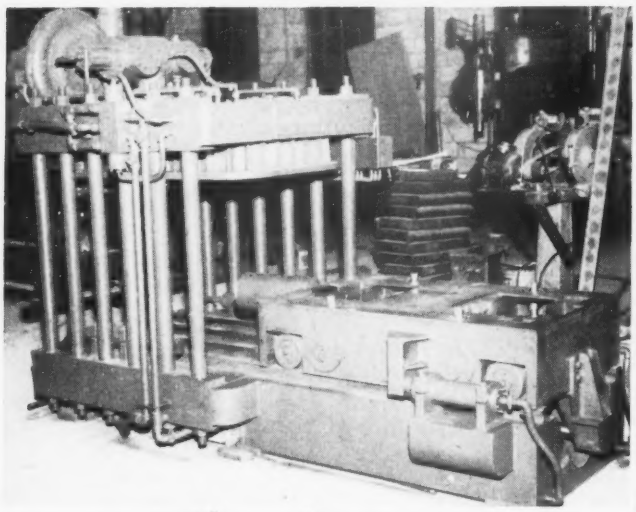
15—This installation, engineered by Westover Engineers in a foundry employing 15 people, employs mold conveyors of specially designed rails on which ride aluminum bottom boards equipped with nonlubricated ball bearing rollers. Molds made on machines in the background are set off on the mobile bottom boards and pushed away from the machines. Empty bottom boards are returned to molding machine by gravity on the rails within the framework under the mold carrying line. Use of sand hoppers filled by a conveyor over the molding machines eliminates hand shoveling, thus conserving worker energy for production work. Elimination of sand heaps provides more floor space and simplifies housekeeping. Hoppers have air-operated gates for discharging sand into the flasks.

16—Use of an air hoist to place a flask on a molding machine is one of many applications of hoists in foundry work. The Ingersoll-Rand Co. model shown here has 1000 lb capacity and is powered by a radial piston type air motor. Hoist operations are controlled by a newly developed pendent throttle shown in the operator's right hand. The two thumb-operated levers control raising or lowering of the load. This is a stationary mounted hoist. However, hoists may be mounted on hand or air-motor driven trolleys, with the trolleys mounted on stationary I-beams or hand or air-motor propelled bridge beams. All hoists of this company operate on 80 to 100 psi air pressure.

17—Low-cost overhead crane service is offered by this Harnischfeger Corp. 5-ton capacity double I-beam model. These travel-lift cranes are available in capacities to 15 tons, providing the features of overhead materials handling plus the obvious saving over larger, unnecessarily high duty cranes.

18—Small sandslingers such as this stationary model of Beardsley & Piper Division of Pettibone Mulliken Corp. will handle the bulk of a small jobbing foundry's medium and large size work. Sandslingers justify their installation on the basis of manhours saved in molding, and on the basis of their flexibility in handling all sizes and types of patterns without job change downtime. Patterns and flasks require no set-up time; they need only be placed beneath the slinger for ramming.

19—Kwik-Mix Co. has expanded the use of its power wheelbarrow with proper attachments to permit fork-lift and flat bed handling of materials. As a wheelbarrow it will carry 10 cu ft of sand or



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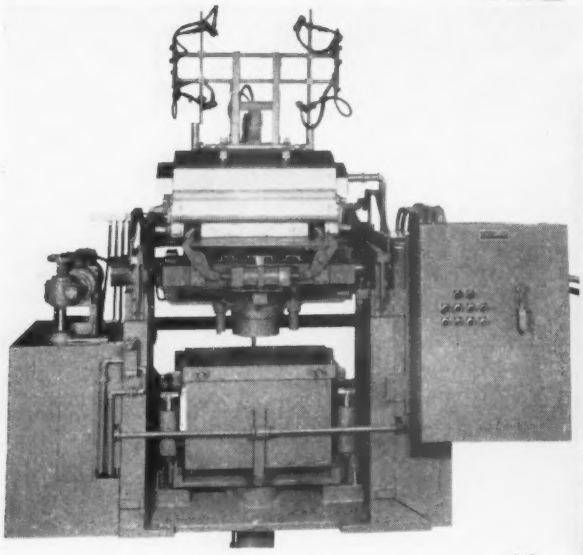

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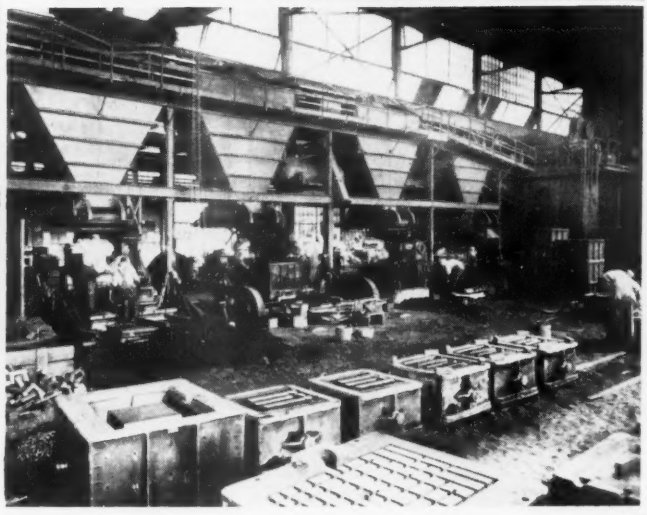

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other loose material and gravity-dump it in one second through a simple release arrangement. As a flat bed truck it will carry 1500 lb of castings and with the fork-lift attachment it will lift and carry ½-ton. Here it is shown delivering empty flasks to the molding floor. The unit is 33 in. wide, has a turning radius of 61 in. and is powered with a 6-hp gasoline engine. It is equipped with soft core rubber tires, internal expanding brakes and "dead man" control to stop the unit if the operator leaves the riding platform.

20—Conventional or high-pressure molding can be achieved on the Taccone diaphragm molding machine distributed by Eastern Clay Products Department of International Minerals & Chemical Corp. In the smaller sizes, such as 16 x 20 in. or 20 x 30 in., the machine permits adaptation to smaller flasks. It is designed for production of two or more flasks in one operation or multiple characters on a universal pattern plate. Absolute control of mold hardness and density regardless of flask size and low installation and maintenance costs are claimed. Squeeze pressure is achieved by introducing compressed air behind a rubber diaphragm which lies against the surface of the sand mold. A pressure regulator governs desired squeeze pressure from the normal of 40 to 50 psi to over 100 psi for precision castings. When high flowability sand is used, the machine is said to provide mold density and casting tolerances measured in thousandths.

21—A shell molding machine capable of continuous production of two shells per minute on a 14 x 18-in. pattern is offered by Shalco Engineering Corp. and Shallway Corp. The machine has a dump box at each end operated in alternate cycles and a movable oven and stripper for production from two patterns. Automatic dump box clamps, counterbalanced pattern frames and dump boxes, sealed ball bearings throughout, positive pneumatic shell ejection and permanently bonded silicone dump box seals are standard features. Consistent, uniform shells are claimed through thermostatically controlled pattern temperature and a motor-driven timer to control investment and curing cycles. Oven and pattern heating may be by gas or electricity.

22—Automatic, pushbutton shell molding machine by Sutter Products Co. has production capacity of 45 to 60 shells per hour on a pattern size

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of 20 x 30 in. with maximum pattern height of 6 in. Machine is air and electrically operated and controlled, with 90-100 psi air and 220-v ac electrical current. Features include cam adjustment of coating and curing times and adjustable thermoswitch control of oven and pattern temperatures. Oven may be heated by either gas or electricity.

23—The design, engineering, fabrication and erection services of C. O. Bartlett & Snow Co. are available for foundry modernization, rehabilitation, expansion or a completely new plant. The systems are engineered to meet individual requirements. In the gray iron foundry installation shown here, an overhead crane picks up poured molds in foreground and moves them to a shakeout at far end of the room. Castings pass from shakeout to cleaning room beyond the wall. Flasks are returned by the crane to molding floor or storage. Sand passes from shakeout to apron conveyor, through a revolving screen and over a magnetic pulley into an elevator visible at right. From the elevator it goes through a pug mill, then an aerator and is discharged to an overhead distributing belt from which it is plowed off into hoppers over the molding machines. Sand remaining on the distribution belt goes over the head pulley and down a chute into buckets which are lifted by the overhead crane and dumped into separate hoppers spaced around the end of the room, each provided with a single molding machine and gravity rollout tables.

24—In sand foundry practice casting quality is dependent in part on the degree of ramming or green mold hardness. A convenient indicator of the desired mold quality is the pocket-watch size, green hardness tester by Harry W. Dietert Co. A hardness test is made by pressing the tester against the mold and noting the dial reading. The slight indentation does not injure the mold or core face. Practical tester application comes in rigging jobs to determine the best squeeze head design, required number of jolts, the squeeze pressure, best pattern angles and use and position on flask bars.

25—This horizontal centrifugal casting machine, a product of the Centrifugal Casting Machine Co., is built in six different sizes covering a casting range from 1 in. ID to 16 in. OD and up to 60 in. long. Its output is adaptable to only a few castings of each of several sizes or to production runs of 20 to 60 castings per hour. Inexpensive permanent molds made of steel tubing are used. Molds can be removed from the machine quickly to change casting size by opening the hinged top cover. The runner pot is mounted on the hinged front door, thus obviating the alignment of the runner pot with the mold after each casting is removed. Molds are cooled by jets of water, permitting close control of mold temperature and continuous production with one mold.

26—Removal of permanent mold castings from the mold is speeded and simplified by use of a Bellows Co. pneumatic device. Power for the ejection device is furnished by an air cylinder of 4-in. bore and 12-in. stroke. This model cylinder will operate on air line pressures ranging from 5 to 150 psi and the developed thrust is approximately 12 times the applied air pressure. Many other models of air cylinders are available for a wide variety of applications in industry.

Coremaking

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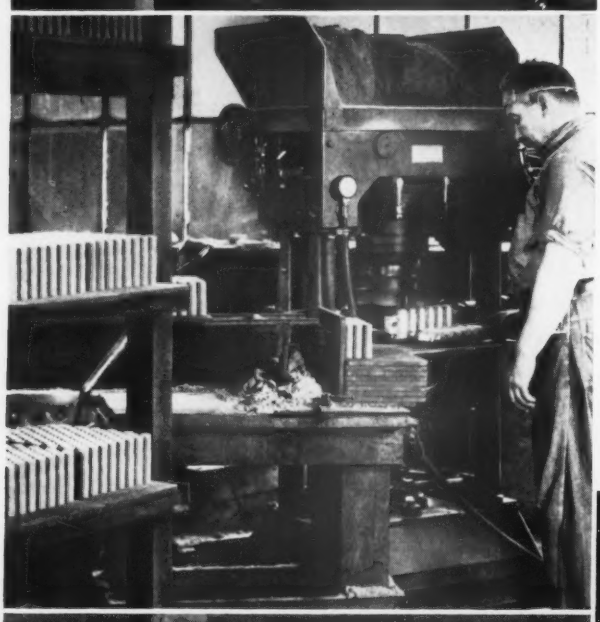

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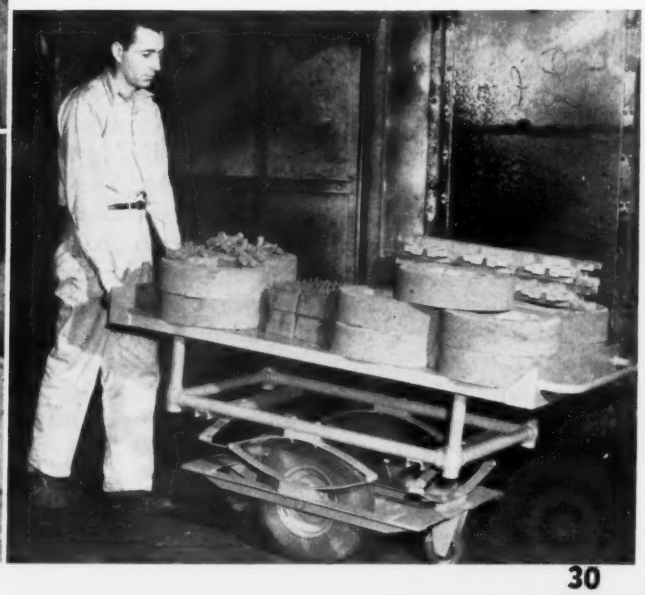
27—This coreblower by Beardsley & Piper Division of Pettibone Mulliken Corp. is designed to handle a variety of coreboxes without downtime for corebox change. The feature that makes this possible is a magnetic holder which permits quick change of blowplates to handle different boxes. Plates are positioned by guides and held in place by the permanent magnet device. When vertically split coreboxes are used, an air-operated clamping device, shown to right of machine, is provided. Machine will handle cores weighing up to 5 lb. A single valve mechanism controls all machine operations, and a core sand hopper is provided on the machine for reloading the sand magazine.

28—Cores weighing up to 10 lb may be produced on this Redford Iron & Equipment Co. blower. Rugged construction and quick change features make the machine suitable for jobbing or high production work. It is equipped with both vertical and horizontal automatically operated corebox clamps. No tools are needed to make adjustments for different width coreboxes. A new type sand magazine is said to reduce possibility of cratering and permits immediate release of the box after cores have been blown. Machine has its own air volume tank, making it a completely self-contained coremaking station.

29—The air jolt, air turnover, foot draw machine made by International Molding Machine Co. is designed to handle jobbing, semiproduction and production work. Corebox or pattern rigging is said to be inexpensive because of the versatility of adjustments manufactured into the unit. Machine has a turnover capacity of 450 to 1000 lb and a draw in the various sizes of 8 to 12 in. It is a versatile unit which may be moved from the coreroom to



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the molding floor to handle work in each.

30—Resilient chassis core trucks by Chicago Mfg. & Distributing Co. are designed for safe and convenient core transportation. The arrangement of coil and elliptical springs, plus pneumatic tires, protects the cores from chafing or breaking even over rough or uneven foundry floors. The truck shown has a 27 x 60-in. loading tray with capacity of 600 lb. Other core moving units range from single wheel core barrows with a capacity of 300 lb to a heavy-duty core truck with capacity of 1400 lb.

31—Tabor Mfg. Co.'s hand ram, hand rollover, hand draw coremaking machine is designed to produce small cores with the least effort and minimum number of operator motions. The corebox is filled, jarred by hand, struck off in the usual way and the coreplate put in place. A half turn of a lever clamps the core. Then it is rolled over. Another half turn of the same lever unclamps, draws the core and swings it out to a convenient position to be carried away. The machine is available in a 4-in. draw to handle coreboxes up to 14 x 24 x 7 in. and in an 8-in. draw to handle boxes up to 16 x 30 x 12 in.

32—Coreblowing machine for producing cores weighing up to 5 lb is made by Wm. Demmler & Bros. Quick, easy adjustment features are said to minimize job changeover time. By using universal blow plates and vented bottom plates, wood corebox equipment can be used and open top or half coreboxes blown on the machine without additional venting. Machine has vertical and horizontal air-operated corebox clamps, controlled automatically by the same hand valve that controls blowing of the core. Maximum corebox depth is 10 in.; maximum width between chuck jaws is 4½-in. Three sand magazine sizes are available.

33—Single compartment rack type oven built by Lanly Co. accommodates a core rack 4 ft wide x 6 ft long x 6 ft high. It is equipped with a gas-fired recirculating heating system with automatic temperature and safety controls. Uniform baking at an average temperature of 450° F is claimed. The oven features 4 in. insulation for minimum heat loss and economical operation.

34—Allis-Chalmers Mfg. Co. has developed for small foundry use this model of its dielectric sand core drier. Requiring floor space of 6½ x 24 ft, it is rated at 51,200 Btu and is capable of drying

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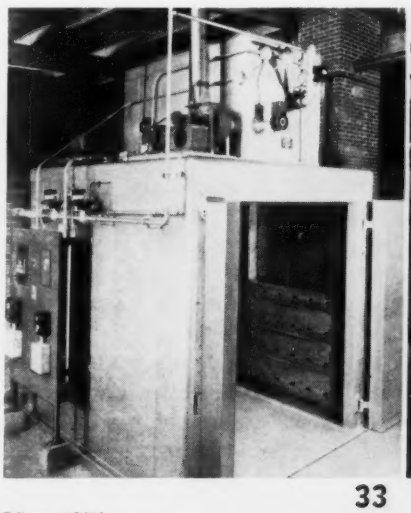

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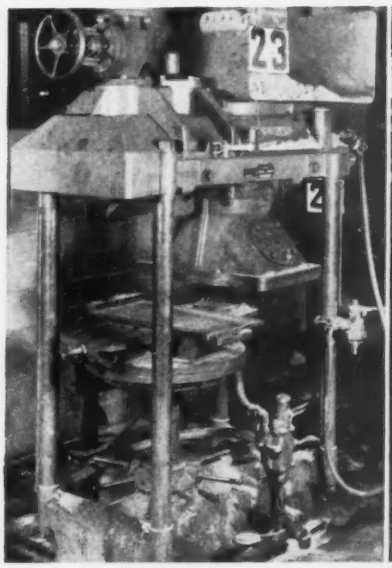

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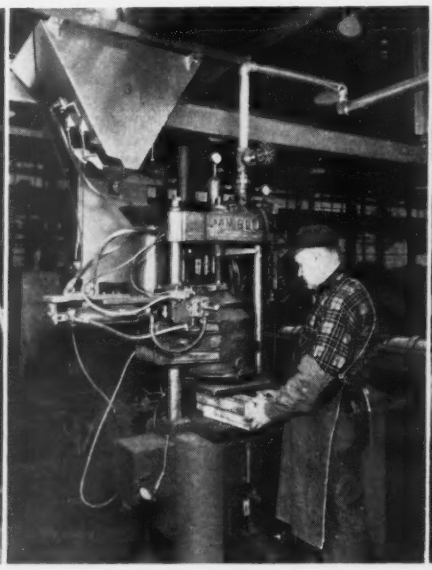

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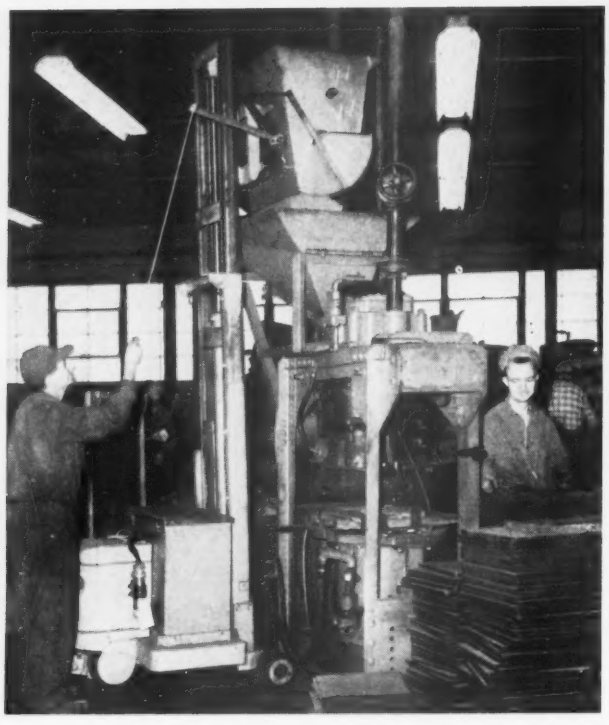

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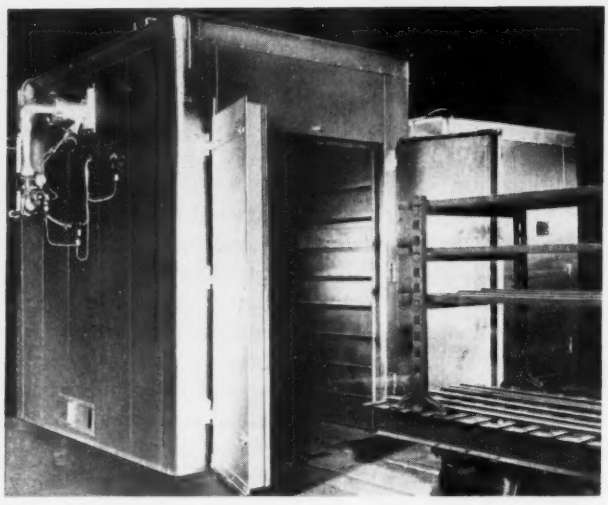

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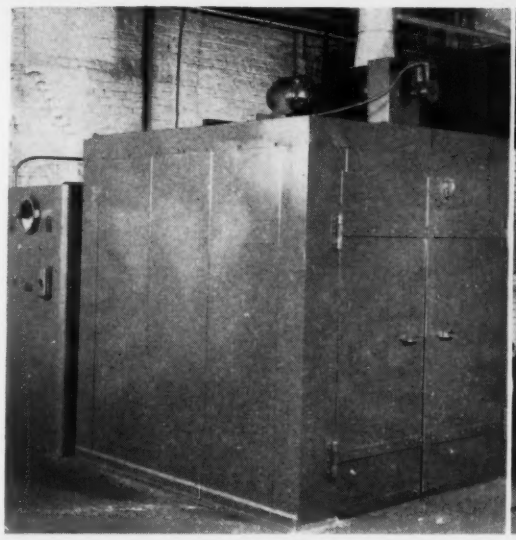
800 lb of cores containing 3 per cent moisture in an hour. The drier incorporates automatic operating controls. Extra large infeed and discharge conveyor sections permit cores to be loaded, dried and finished on the unit without additional handling. Low baking cost, reduced core breakage, dimensionally accurate cores for closer casting tolerances, and increased production are features claimed for the unit.

35—Manual or automatic controls are available for this Osborn Mfg. Co. blower, which will produce a core up to 25 lb. Horizontally or vertically parted boxes may be blown, and if the latter are used, horizontal air clamps may be fastened to the table to hold the box halves in position. Sand hopper on this machine is relatively low so that sand may be shoveled from the floor or wheelbarrow or supplied from overhead as shown. Machines may be furnished with various size sand reservoirs. Table height can be varied over a wide range by rotating hand wheel at the bottom to compensate for coreboxes of different height.

36—Outstanding feature of Federal Foundry Supply Co.'s pulsator coreblower is its ability to blow cores in formerly hand-rammed wood or metal open boxes with no special rigging or reinforcement. A prefill unit fills coreboxes, either open or closed, using low-pressure air. Then to pack sand in wooden boxes pulsating action with full line pressure is used. Metal boxes may be filled with one continuous blow at full pressure. A selector switch permits cutting in or out the prefill and pulsating operations. Machine will handle coreboxes within a 6-in. height range with adjustment. Practically any core sand mix can be blown satisfactorily. The model shown has a capacity for blowing 40-lb cores.

37—Automatic sand riddling device by Beardsley & Piper Division of Pettibone Mulliken Corp., when used in conjunction with core or molding machines riddles a stream of sand onto the pattern. The op-



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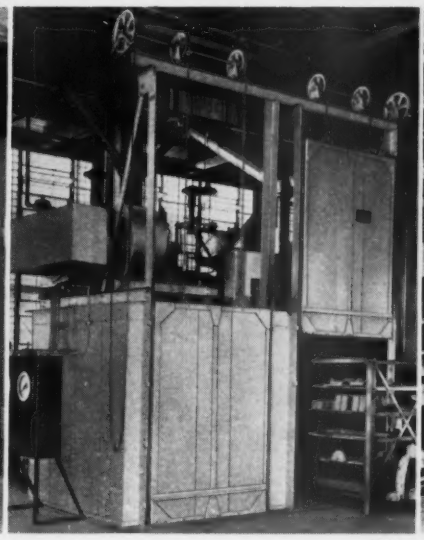

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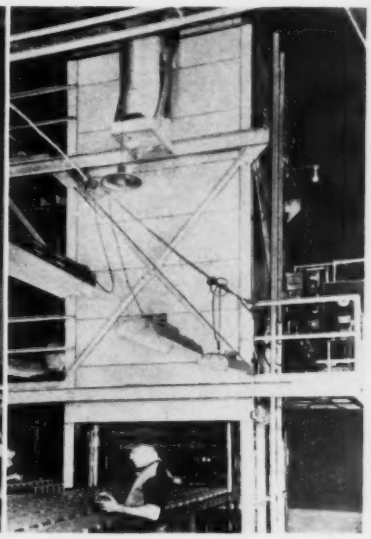

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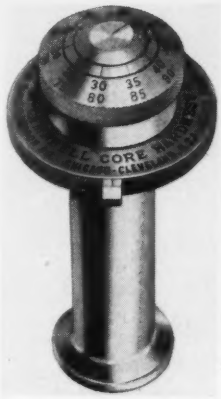

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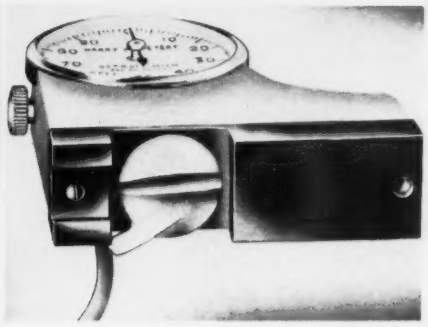

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erator loads a shovelful of sand into the hopper of the riddle and then, grasping a convenient handle, slides the riddle over the pattern. An electric motor furnishes vibrating power. Another model of the unit pivots into position over the pattern instead of sliding or rolling into position.

38—Electric truck by Lift Trucks Inc. has capacity of 1000 lb and total lift of 120 in. Powered by a 12-v battery with two motors, one for the lifting mechanism and the other for the drive wheels, the truck houses all controls within the steering handle. It will operate in limited areaways and is shown here filling the sand hopper over a coreblowing machine.

39—Michigan Oven Co. offers a line of standard ovens in five sizes with clear work space 4 ft wide x 4 ft deep x 6 ft high to 6 ft wide x 7 ft deep x 6 ft high. Operated by gas or electricity, the ovens have an air recirculating system designed to provide uniform temperature. Telescoping, insulated panel housing construction is utilized to reduce heat loss and minimize warping and twisting from expansion and contraction. Operating temperature ranges up to 550° F. Ovens may be loaded by car, truck or lift rack.

40—Corebaking ovens ranging in size from 6 to 10 ft square by 7 to 8 ft high are made by Industrial Ovens Inc. Gas, oil or combination burner-fired, the convection circulating heating system is controlled by a temperature regulator for uniform baking. Core loading is done on adjustable shelf trucks, permitting complete adaptability to small foundry operations.

41—Two-compartment corebaking oven by Carl Mayer Corp. will handle a rack 4 ft wide x 6 ft long x 6 ft high in each compartment. Each rack holds maximum load of 3000 lb. Overall dimensions of oven are 14 ft wide x 7 ft, 8 in. long x 8 ft high, and each compartment is served by a 500,000 Btu recirculating combination gas or oil-fired heater. Potentiometer recording controls maintain temperatures up to 500° F. Counterbalanced, lift doors, said to require mimimum effort, close front of each compartment.

42—Tower oven by Foundry Equipment Co. features accurately controlled, low thermal head, gas, oil or dual-fuel heating system. Ovens are designed to handle conventional oil, fast-bake oil or synthetic resin binder core mixes. Large and small cores can be baked together without overbaking thin sections or sharp edges, it is claimed. A built-in cooling system smokes-off and cools cores before they are unloaded.

43—The Claud S. Gordon Co. core hardness tester is designed to obtain values for the relative hardness of any core surface. Values of different core sand mixtures, uniformity of baking conditions throughout the oven and whether core hardness falls within desired limits can be determined quickly with the instrument. Operation of this rotary-type instrument is based on the depth to which an abrading point moves into the material when it is under constant force for a definite travel distance.

44—Another dry hardness tester for cores translates depth of cut into hardness through a dial indicator. It will provide hardness readings based on either the rotary or scratch testing methods. No zero settings or tables are needed and tests are said to require only 2 seconds. In addition to testing cores the instrument will measure hardness of washes for died cores and molds. Supplier is the Harry W. Dietert Co.

Sand Conditioning

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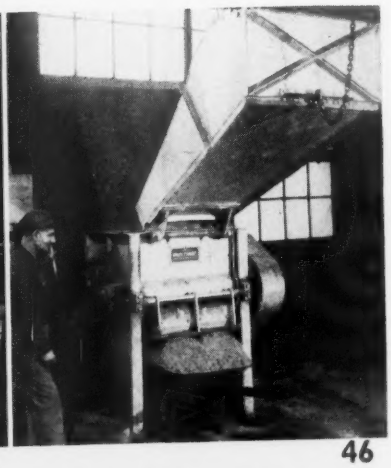

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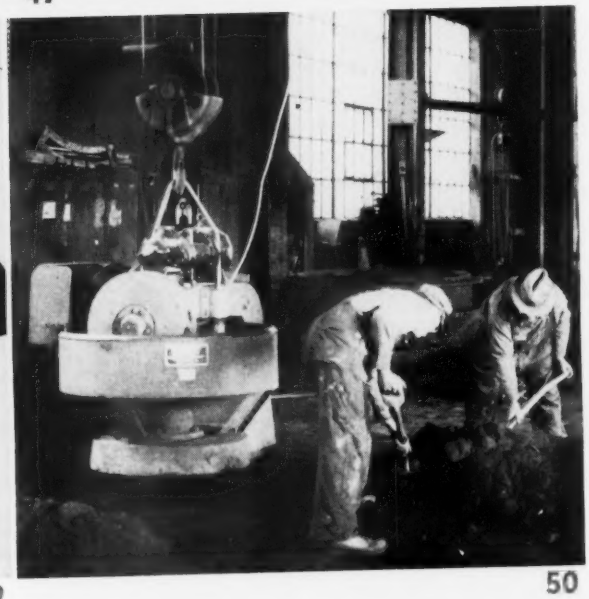

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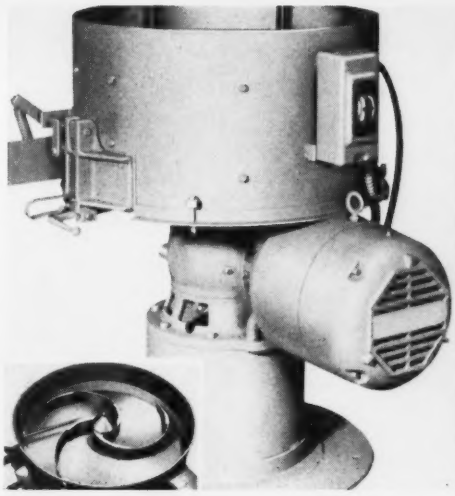

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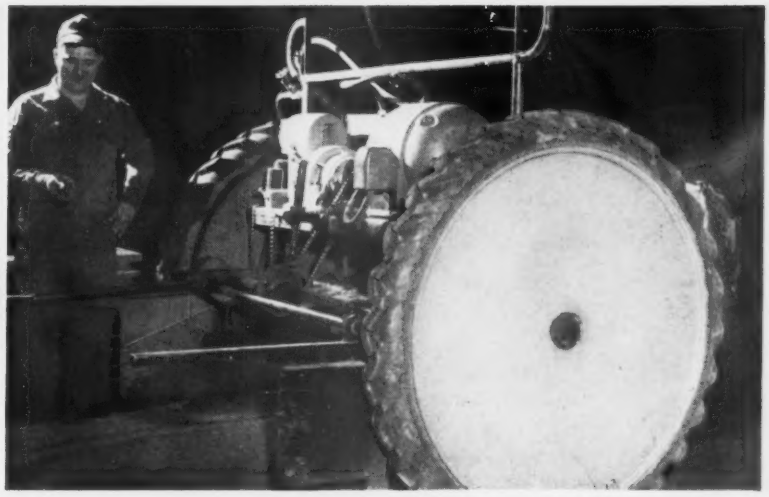

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45—A good nucleus for further mechanization, this National Engineering Co. unit consists of hopper, vibrating screen-feeder, loader, 700-lb batch muller, water meter and aerator. Used sand brought to the hopper by a front-end loader or a clamshell is drawn out at a uniform rate by the feeder, which separates oversized material and discharges screened sand into the bucket loader. Operator makes bond additions, and bucket is raised and discharged into the mixer when full. Water is added in the mixer, through the meter. After mulling, sand is discharged through the aerator.

46—Core or molding sand mixer made by Baker-Perkins Co. incorporates mixers which rub, stir and knead sand mass without breakage of silica grains. In addition to distributing bond thoroughly, they provide aeration effect and eliminate need for riddling. Processed sand can be discharged into wheelbarrow or other receptacle. The mixer is available with an air or electrically operated skip hoist, as shown.

47—For use in conjunction with a muller or with a sand separator and blender, the scrap control unit offered by Royer Foundry & Machine Co. removes large scrap mechanically and small scrap magnetically as fast as a front-end loader can supply sand—up to 60 tons per hour. Clean sand is discharged into a skip hoist which moves it to the conditioning unit. All equipment is above floor level, and hand shoveling is eliminated.

48—Complete portability keynotes the operation of this unit of Beardsley & Piper Division, Pettibone Mulliken Corp., for facing sand, backing sand, core sand and special material batches. Barrow containing sand to be mulled is moved into position beneath mulling mechanism, which is lowered into position. When sand is mulled, the mechanism is raised, and one man moves the mulled sand to the point of use. Several barrows can be used with one mulling mechanism; this increases capacity, which is 2 to 3 tons per hour.

49—Aimed at the small foundry not equipped with a sand handling system, a 2 x 3-ft portable unit made by Simplicity Engineering Co. screens, aerates and fluffs sand in one operation. Sand is shoveled directly on the screen. Hard core butts, chills, gaggers, nails and other scrap pass over the screen, under the lump breaker, onto the vibrating scrap chute and into a receptacle. All lumps and balls of good molding sand are broken down by the lump breaker and pass through the screen. Sand then falls on a vibrating chute and is conveyed to the aerator, from which it is thrown into windrows or heaps.

50—Users of Clearfield Machine Co.'s No. 404 and 414 mixers can plan sand preparation around the portability of the mixing unit, which can be suspended from a 2-ton crane or a monorail hoist and carried over a molding floor. It can be operated while suspended. Portable features may be retained without use of crane if the base is equipped with roller bearing casters, available optionally. Capacity of the 414 mixer is 4 cu ft of mixed, tempered, aerated sand per batch.

51—Four models of Federal Foundry Supply Co. mixers offer core oil sand mixing in 3 minutes without crushing or heating. According to size, they deliver 15, 100, 300 and 600 lb per batch. Facing sand or dry compound mixtures in batches two-thirds as large are mixed in 1½ minutes. Flexible, whirling spring steel arms rub and squeeze sand with a regulated pressure that compensates for variations in the amount of sand. All models can be moved by crane or lift truck.

52—Self-propelled sand conditioner produced by The Moulders' Friend screens and wets down sand as it conditions it. Operated by one man, it has a capacity of 2 tons of conditioned sand per minute. No shoveling is required. Travel speed in either forward or reverse ranges from 5 to 30 ft per minute. Large pneumatic tires give traction on dirt floor.

53—When sand conditioning and handling units made by Newaygo Engineering Co. are used together, the sand moves through shakeout, preparation and molding without shoveling or rehandling. Conditioner, for nonferrous foundries only, contains a magnetic separator, a tempering unit, an aerator and adjustable sand deflectors. Vibrating or stationary shakeouts are optional. Handling unit, for any type of foundry, raises sand overhead, to molders' hoppers, blending and aerating it in the

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process, then shuts off automatically when sand in the hoppers reaches a predetermined level.

54—Built with loading bin at a convenient height for use with a front-end loader, a sand conditioner manufactured by Beardsley & Piper Division, Pettibone Mulliken Corp., magnetically separates, screens and aerates up to 30 or 40 tons of molding sand per hour. Sand is charged into bin, carried beneath lump breaker and discharged over the magnetic separator. It then is screened, aerated and discharged into piles or windrows.

55—Permeability is that property of a foundry sand which allows the passage of gases through it. This Claud S. Gordon Co. permeability tester employs a test method which requires measurement of the time required for a definite volume of air at a fixed pressure to pass through a standard test specimen, prepared on one of the firm's rammer-compression testers. Permeability values indicated on the unit are derived from the formula proposed by the AFS Committee on Foundry Sand Research.

56—Muller-conditioner units, made by Beardsley & Piper Division, Pettibone Mulliken Corp., are offered in a range of sizes with capacities from 7 to 70 tons per hour. Capacity of unit shown is about 25 tons. Front-end loader moves shakeout sand to conditioner, which performs screening and magnetic separation, then delivers the sand to the muller by skiphoist. Mulled sand is discharged into floor-level discharge hopper, and front-end loader carries mulled, conditioned sand back to molding floor on its return trip. Entire cycle takes as little as 1½ to 2 minutes.

Great Western Mfg. Co. offers gyratory foundry riddles with fully enclosed 1/6-hp motors for cleaning sand heaps, mixing facings and for other uses. Type "V", particularly adaptable for small foundry work, has a 20-in.-diam sieve with special clamp for 5-second changes. Screens fine, medium or coarse sand. Large version of the same model has 36-in. sieve. Standard model weighs 100 lb and is 4 ft 6 in. high.

57—Regardless of its size, any foundry must be able to control the moisture in its molding sand. Device illustrated can be unpacked, set up and made to yield results in 10 minutes. Time for individual tests need not exceed 3 minutes. The unit can be located in the foundry itself. Manufacturer is Harry W. Dietert Co.

58—Combination rammer-compression tester made by Claud S. Gordon Co. is designed to ram standard 2-in. specimens for determining green compressive strength of molding sands and to test these specimens in compression. The same specimens are used in permeability tests.

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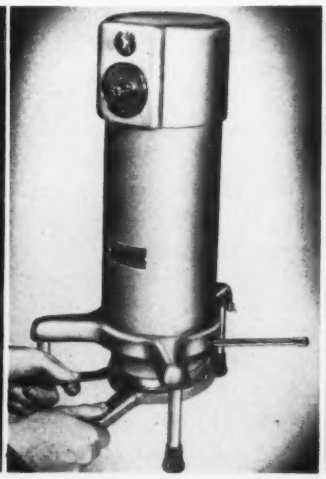

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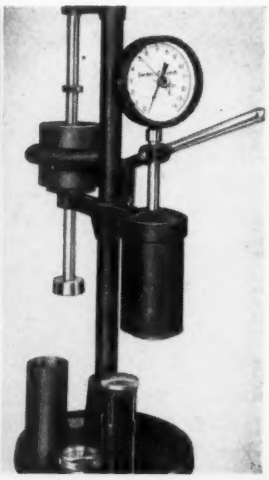

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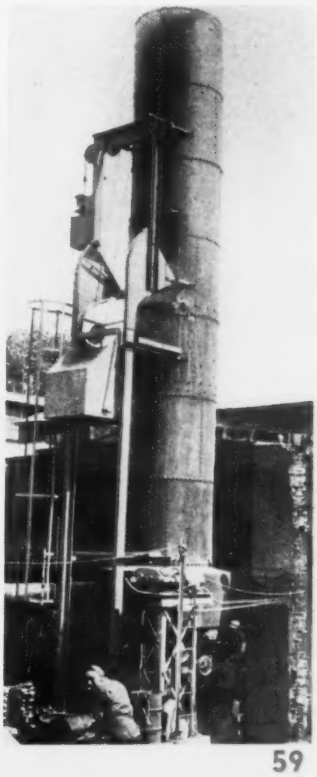
Yard Work and Furnace Charging



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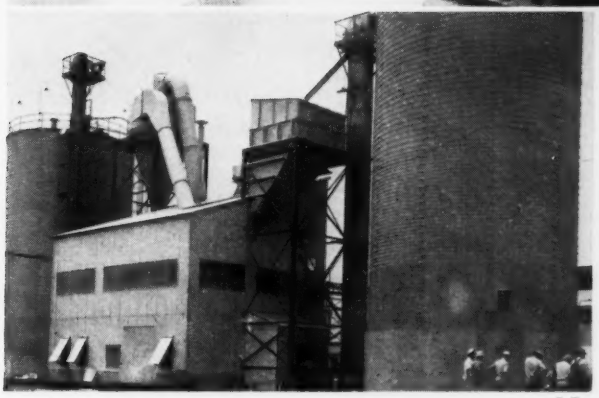

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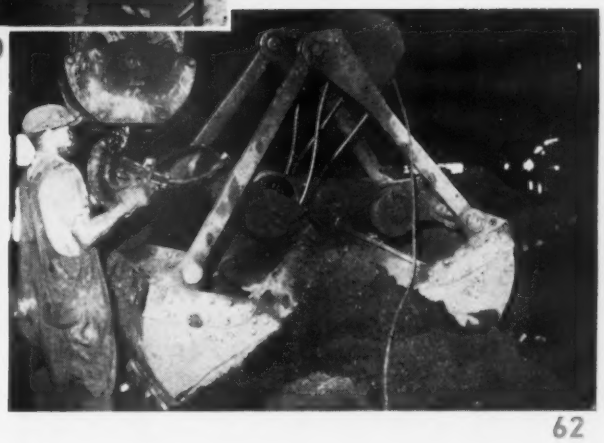

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59—Small foundries which have put off mechanizing their cupola charging because of the expense involved may find Whiting Corp.'s side-dump skip hoist cupola charger the answer to their needs. Materials are loaded at ground level, by wheelbarrow, dump car or other means. No charging floor is necessary. A push of the control button sends the loaded bucket up to the charging door, automatically dumps the charge and returns the empty bucket to loading position. The unit has three basic parts—vertical or inclined track, hoist unit and a dump bucket.

60—Lift trucks can cut handling costs. This Hyster Co. 2000-lb capacity model is handling a load which formerly required four wheelbarrows. It carries core nubs and cupola slag to the dump, returns home scrap to the cupola for remelting, transports new and burnt sand and performs miscellaneous jobs around the foundry. Operation is fast as well as efficient.

61—Floor space is a scarce commodity in most foundries, particularly small ones. Concrete silos provide a clean, convenient way to store sand and to release space it otherwise would occupy. Marietta Concrete Corp. silos are constructed of precast concrete staves, reinforced on the outside by steel hoops. Solid staves are 2½ in. thick; those with air space are 3⅝ in. Each silo is individually designed.

62—Standard weight, single line, hook-on clamshell buckets are suitable for many foundry applications, such as digging pits, filling flasks, unloading cars, handling coke and other jobs. Placing the yoke over any crane hook puts one of these buckets

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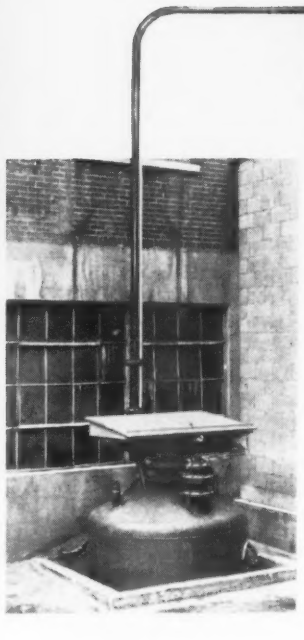

into service instantly. Removing the bucket and freeing the crane for other duty is equally fast. Wellman Engineering Co. is the manufacturer.

63—Hauling bulk materials is an endless job in foundries, but Prime-Mover Co.'s ¾-ton capacity powered wheelbarrow can make the job easier. The 10-cu-ft dumping hopper latches on the chassis and is quickly interchangeable with a flatbed platform which is more useful for large material. The 31½-in.-wide machine is equally useful inside or outside. Engine, differential and all-gear transmission are enclosed to keep out dust and sand.

64—One of the most versatile of foundry tools is the front-end loader, like this Frank G. Hough Co. product with 12-cu-ft capacity. It features hydraulic bucket control with an automatic tip-back lifting motion, and the full-reversing transmission provides two speeds in each direction, including 10-mph reverse speed. Rear wheel steer adds to its versatility and efficiency. Lifting capacity of the model shown here is 1000 lb.

65—Magnet chain should be designed to distribute load weight evenly and to assure level lifts, as S. G. Taylor chain is said to do. A locating plate in the ring keeps the three suspension legs at 120 degree centers, eliminating friction, twisting and gouging. Up to 110,000 lb can be lifted on a 65-in. magnet used with a 1¼-in.-diam, three-leg alloy steel chain assembly, which is heat treated and never requires annealing.

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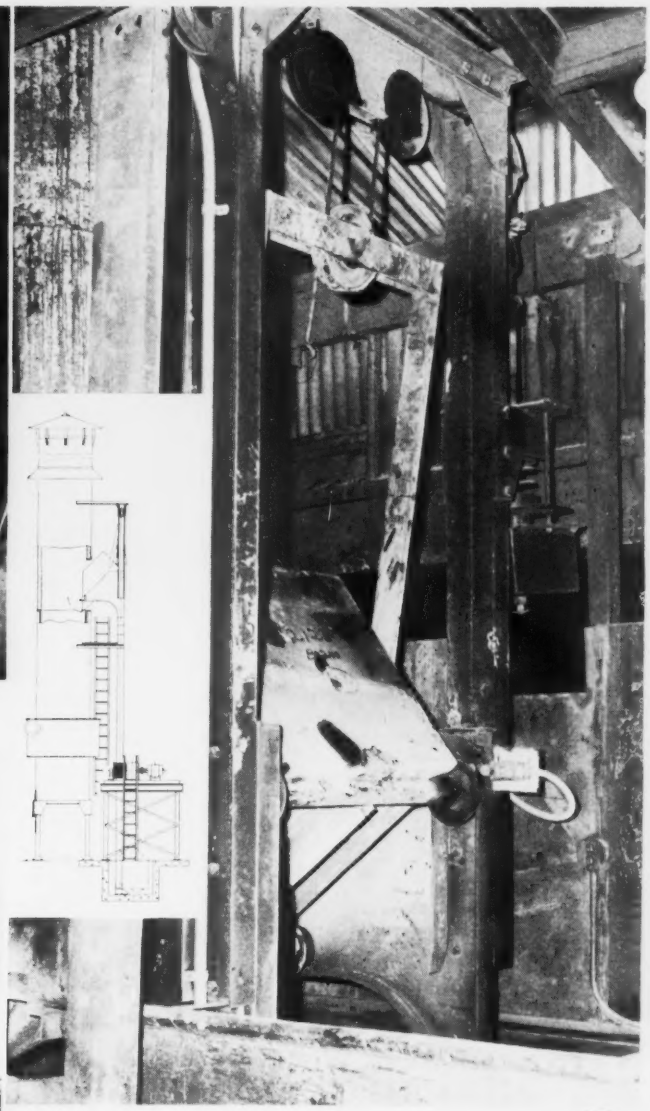

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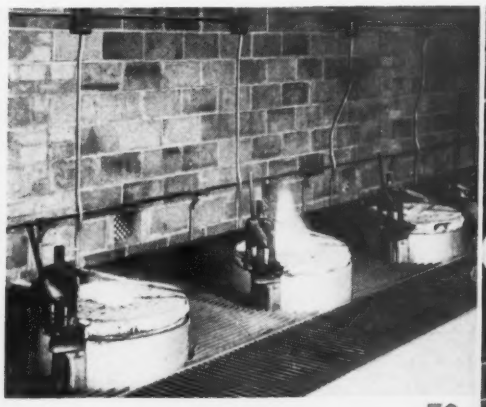
66—Sand conveying is always a basic foundry problem. The foundry compressed air supply can move core or molding sand in a closed pipe from storage facilities at floor level to an overhead storage hopper for gravity feed to mullers. Pressure vessel shown at left has 5-ton capacity and is loaded at top with a power scoop, conveyor, chute or manual shoveling. Pushing a button closes the loaded vessel and allows air to enter at 40 to 80 lb pressure, depending on the sand to be moved. Contents empty to storage tank above in 5 minutes. Standard steel 4-in. pipe line uses wear-resistant iron elbows at bends and in the sectional plate receiver section on top of the storage tank. Cloth bag filter is mounted on top of the unit, as shown at right. Brady Conveyors Corp. is the manufacturer.

67—Manual loading and unloading of bulk material are expensive and unnecessary. A car of sand, for example, can be unloaded in only a half-day by three men using one of these American Conveyor Co. belt conveyors. Manufactured in 8 and 12-in. belt widths and in standard lengths from 13 to 20 ft, these units can be furnished with either electric motor or gasoline engine to meet requirements of individual foundries.

68—Self-propelled cranes can do a big job in a foundry yard. Wayne Crane Co. Division, American Steel Dredge Co., offers this one-man, 8 to 10½-ton lifting capacity model with four-wheel drive. In addition to the magnet, such other attachments as shovel, trench hoe, clamshell, dragline and crane hook can be used with the machine to perform a variety of jobs.

69—Particularly adaptable to small cupolas up to No. 5, Grindle Corp.'s side-dump vertical skip hoist cupola charger has been developed to distribute the charge effectively over the entire area of the cupola instead of to one side. Principal improvement is in the head, shown here, which provides a gradual discharge into the cupola with a horizontal movement, with consequent better distribution. It is available in standard sizes.

Melting and Pouring



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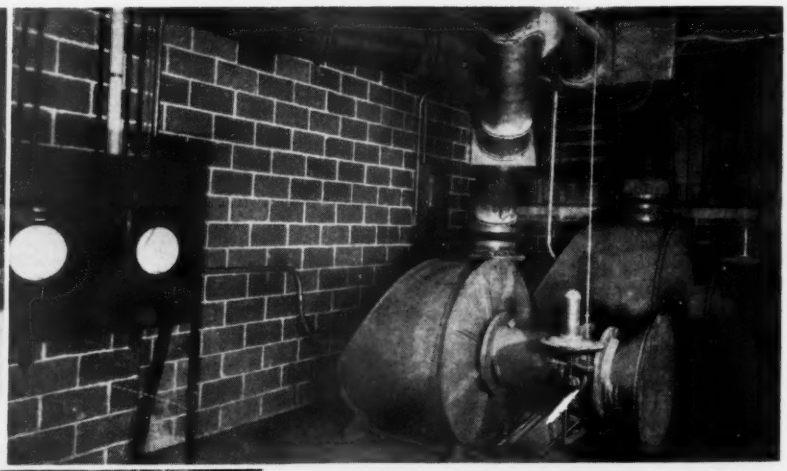

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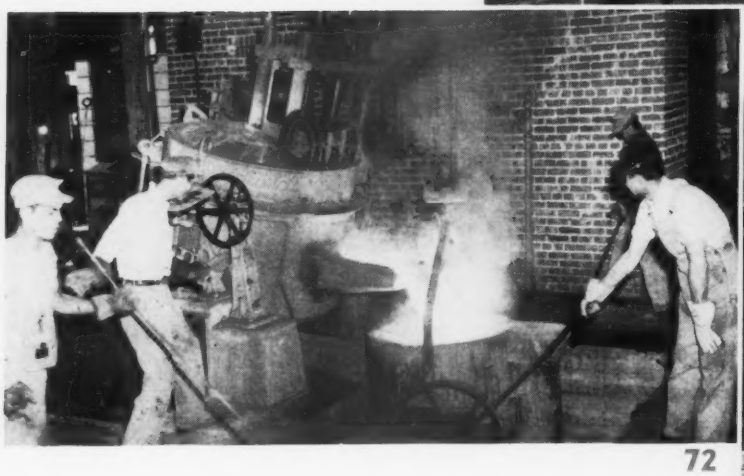

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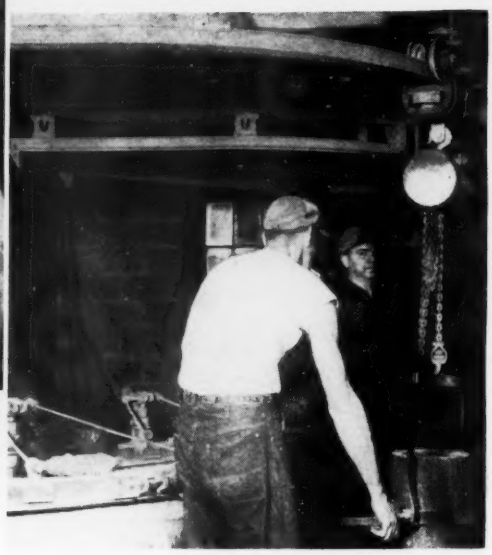

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70—Efficient, reliable melting equipment is a must in every foundry. Small nonferrous foundries find that stationary crucible furnaces fit their needs and also offer flexibility. Crucible changes permit any type of metal to be melted. Campbell-Hausfeld Co. units, which use gas or oil interchangeably, are manufactured in sizes to accommodate No. 10 to No. 400 crucibles. They can be placed in a pit or at floor level.

71—In use on cupolas as small as 18 in. ID, Foxboro Co.'s air weight controller can improve the performance of cupola operations in any foundry. Blast air is controlled by weight rather than by volume. Uniform heats, efficient fuel use and better castings are said to result. On the right, same illustration, are two Spencer Turbine Co. cupola blowers, designed to provide a reliable source of adequate volume and pressure. These units perform noiselessly and without vibration; they require no special foundation. Pressure is uniform throughout the operating range, regardless of the amount of air used.

72—Small foundries can melt 1000 lb per hour in this Pittsburgh Lectromelt Furnace Corp. arc type furnace, which usually is operated with 2000-lb heats every 2 hr. It is rated at 400-500 kva. Electrical substation is included with switchgear and automatic controls. Either iron or carbon and alloy steels can be melted. For charging or patching, the top is raised hydraulically and swung aside. Other units available have heat sizes of 20 lb to 150 tons.

73—Installation of this hand-propelled tramrail system made by Cleveland Tramrail Division of Cleveland Crane & Engineering Co. enabled a ten-man brass foundry to pour eight heats in a day instead of three. The 200-lb crucibles used previously have been replaced by 240-lb models. The system saves heat and reduces employee fatigue, in spite of the more than doubled output.

74—Gravity roller conveyors are another type of

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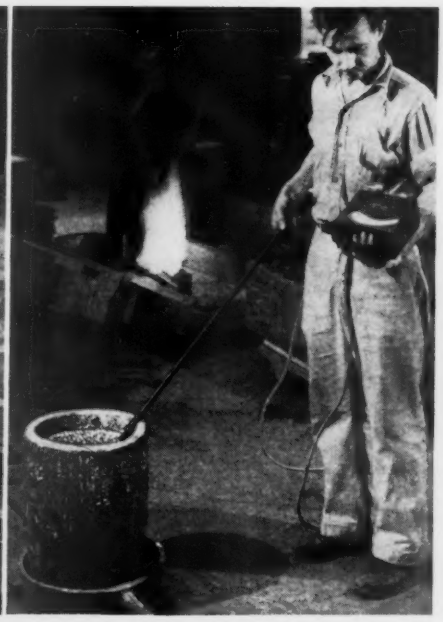

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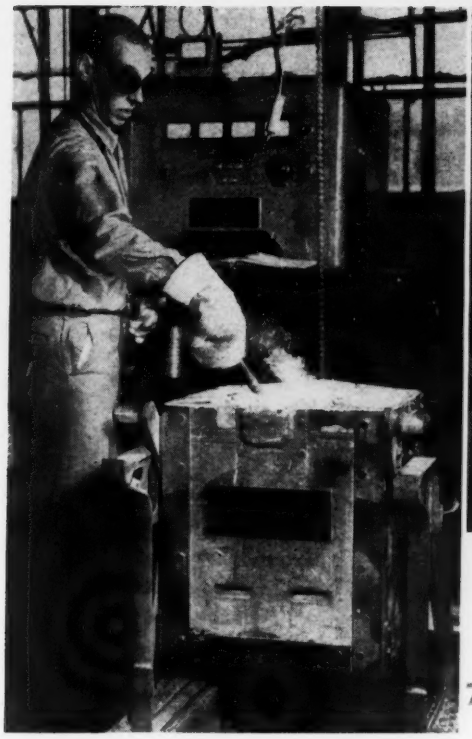

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materials handling aid applicable to small foundry operation. All pouring is done on the installation shown here; the equipment serves both cope and drag and matchplate molding machines. Used to transfer molds to the shakeout, the transfer car provides flexibility to the system. Mathews Conveyer Co. is the manufacturer.

75—Many aspects of foundry operation have no relation to a foundry's size. One of these universal elements is the need for temperature control of the kind provided by L. H. Marshall Co. enclosed-tip thermocouples. The short, straight type shown is for checking temperature in a ladle. A long, curved model for heavier duty furnace use also is available. Portable units can be plugged in anywhere, and stationary thermocouple equipment can be adapted to a variety of installations.

76—High-frequency induction melting installations made by Ohio Crankshaft Co. are best suited for remelting high-grade metal for high-alloy and stainless steel castings. Rate of heating and pouring temperature are controlled by regulating power input to the inductor coil. Furnace body is mounted on double trunnions to facilitate pouring. An overhead crane or a hoist tilts furnace for pouring. Units are available in a wide range of capacities.

77—Both ferrous and nonferrous foundries can use the type of indirect arc rocking furnace shown here. A product of Detroit Electric Furnace Division, Kuhlman Electric Co., it is rated at 175 kw and delivers about 3½ tons of brass or 2 to 2¼ tons of iron or alloy steel in an 8-hr day. On duplexing service, its capacity is about 10 tons per day. Rating on the furnace is 250 kva, 700 lb nominal cold charge, 1250 lb molten iron capacity.

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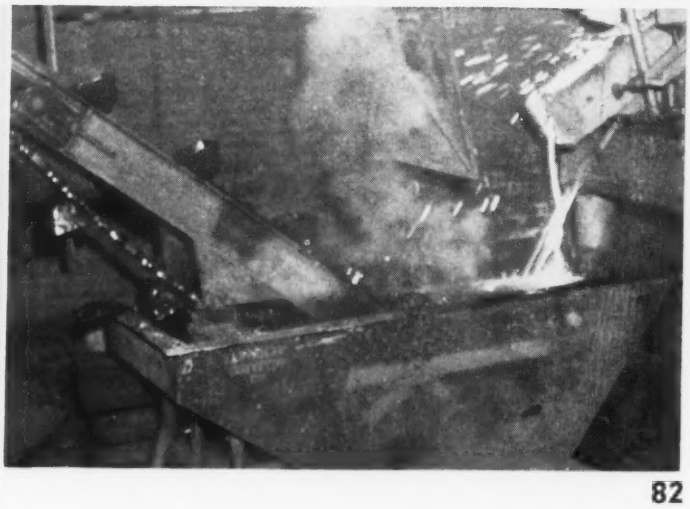

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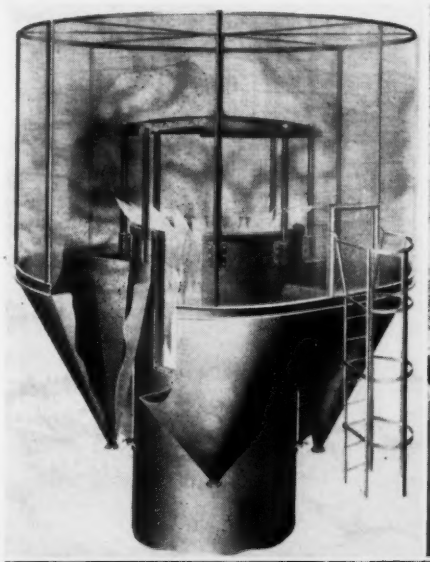
78—Ajax Electrothermic Corp. induction melting furnaces enable small foundrymen to begin operations at almost any investment level, with minimum manpower and with either converter or generator powered units. The illustration shows a 100 kw "lift coil" furnace lowered over a precharged crucible. About 200 lb of bronze can be melted in 20 minutes. The transfer car permits melting in two crucibles alternately. While one is being poured the other is in the furnace. Metal is melted at the rate of about 600 lb per hour.

79 — Double-chamber reverberatory aluminum melting furnace made by Stroman Furnace & Engineering Co. has 700-lb holding capacity and take-away capacity of 400 lb per hour. Metal is available continuously and can be held overnight with no ill effects and at little cost. The unit was designed to eliminate moisture in metal before melting, to prevent overheating of the molten bath, to provide the proper type of dross covering over metal in the holding furnace and to eliminate hot charging in permanent mold and die casting plants.

80—Optical pyrometers are instruments with which the unknown brightness of an object—molten ferrous metal—is measured by comparing it with the known brightness of another source which can be calibrated correctly. Temperature then is determined by the brightness. Pyrometer Instrument Co. pyrometers are designed to give direct Fahrenheit or Centigrade temperature readings. Self-contained, they weigh less than 3½ lb. The entire working mechanism is contained in a small



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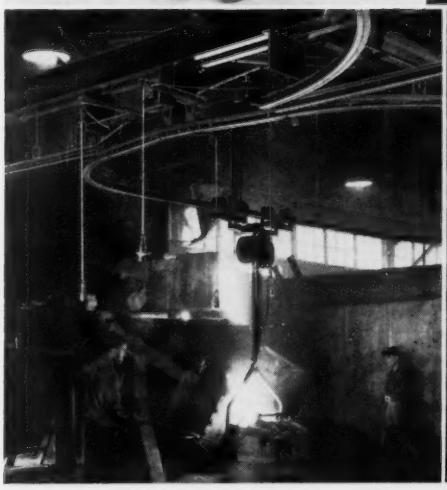

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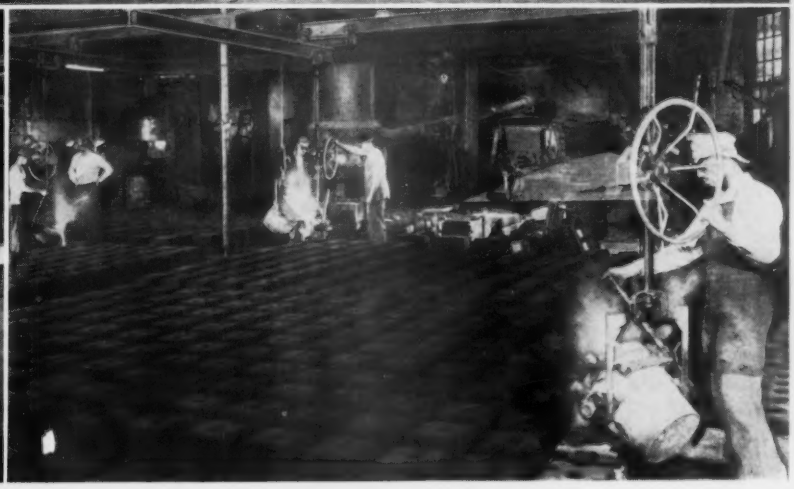

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shell less than 10 in. long and 3 in. in diam. The company recommends its immersion pyrometers for nonferrous metals.

81—Surface pyrometers do a variety of jobs and are finding particular application in shell molding operations. Available in a wide selection of temperature ranges, with interchangeable thermocouples and extension arms, Pyrometer Instrument Co. units are suitable for any surface or subsurface, metallic or nonmetallic, flat or curved.

82—Slag disposal is a common foundry problem which can cause expense and inconvenience and create unsightly dumps. An American Conveyor Co. slag disposal unit is capable of handling slag produced by cupolas melting from 5 to 25 tons per hour. Slag is spouted into a quench tank where it is transformed to a granulated form that can be sold for fill, saving manpower and ending hot slag handling.

83—Foundries with a cupola emission problem can collect sparks and large particles with Grindle Corp.'s screen cage spark and dust arrester. Particularly adaptable to small cupolas, to cupolas operated only a few hours a day and to circumstances not requiring collection of fine, particulate matter, it also can be used for large cupolas if only 30 to 50 per cent efficiency is required. Self-cleaning and manually cleaned models are available.

84—Small foundries can dry and preheat ladles quickly and uniformly with North American Mfg. Co. burners. In the accompanying illustration, 125 to 500-lb ladles are being preheated with burners firing through a plastic refractory combustion tile encased by a steel shell with an alloy lip ring. A dry 500-lb ladle can be heated ready for use in 45 minutes with gas, or faster with oil.

85—Overhead monorail installations can facilitate execution of many foundry operations. This view shows an American MonoRail Co. set-up for conveying ladles of molten metal. The overhead monorail loop at the furnace will accommodate a number of ladles waiting to be filled without interfering with movement of the filled ladle off the loop and through a switch to one of the runways leading to a pouring station.

86—Modern Equipment Co. pouring devices reduce fatigue by eliminating lifting and carrying of ladles of molten metal, as in the 28-man foundry shown here. They are suspended from a trolley operating on a monorail or crane bridge beam to permit movement in any direction and to provide access to all molds on a pouring floor. The pouring device raises or lowers the ladles to the proper pouring height. A line of ladles is available.

Shakeout and Cleaning

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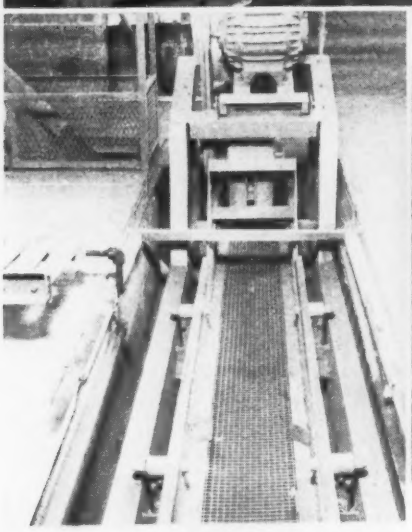

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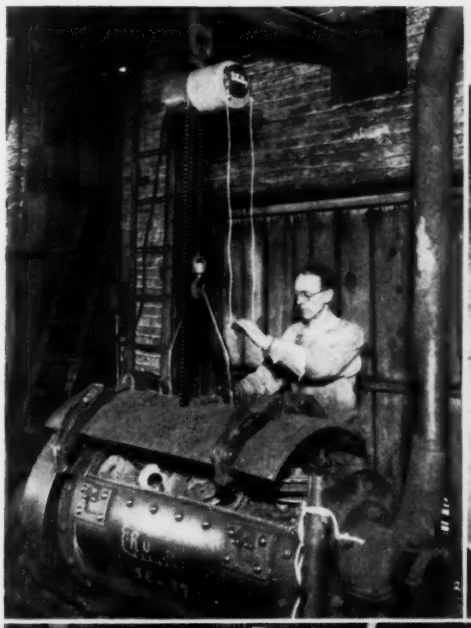
87—This Link-Belt Co.'s oscillating conveyor has a perforated trough at the feed end to act as a shakeout and a plain section of trough for spruing and sorting of castings. A damming gate between sections, which holds back castings for proper shakeout action, is operated by an air cylinder. Part of a compact, pre-engineered sand preparation and castings handling system developed for the small foundry, this unit operates in conjuction with a magnetic separator and sand muller. The system handles up to 50 tons of sand per hour and castings weighing up to 200 lb each.

88—Combination screen and conveyor handles shake-out sand directly from the breakout floor, screens out core butts, stray metal and other foreign material, and delivers the cleaned sand to the sand preparation system. Basic unit in the equipment is the oscillating conveyor made by Ajax Flexible Coupling Co. in open and closed pan types



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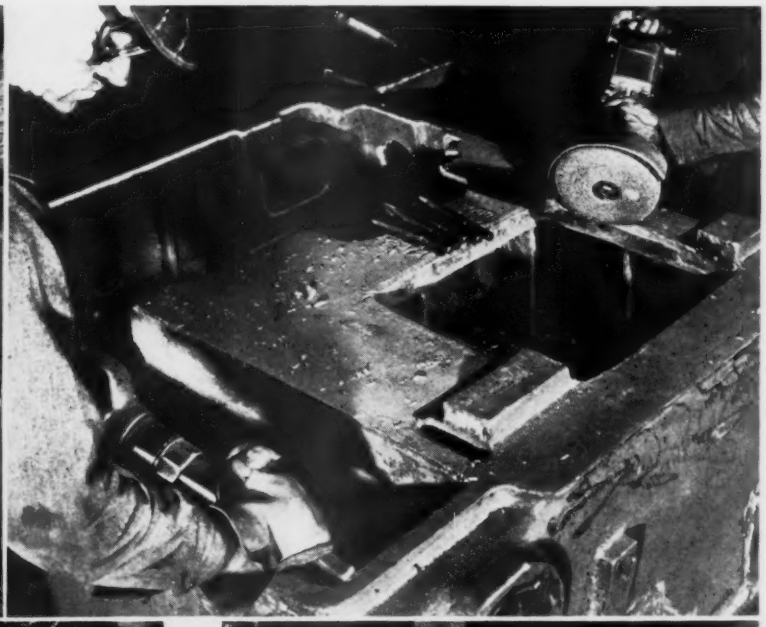

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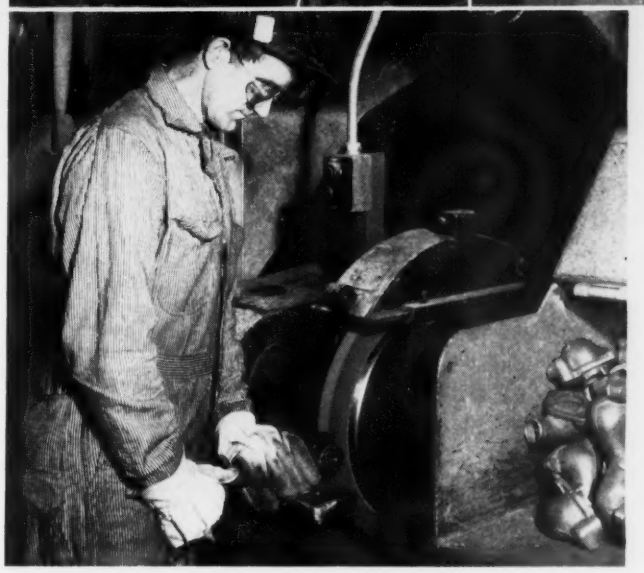

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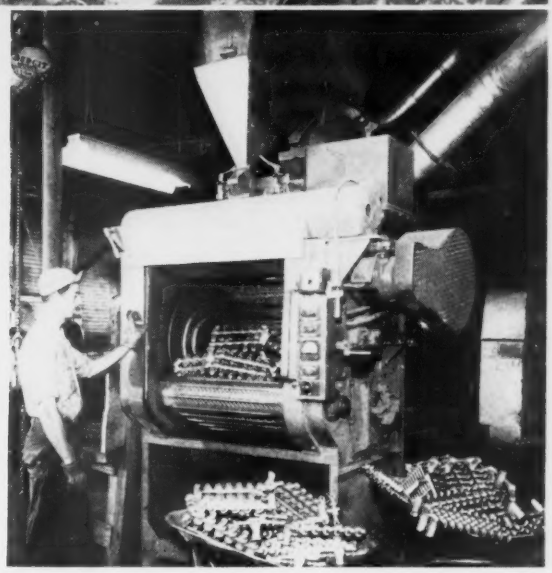

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for installation on or below the floor.

89—Removal of smoke and dust from mold dumping stations is accomplished effectively by this Claude B. Schneible Co. hood. Hoods may be connected singly or in series to a collector. The company's single wet-type collector for small operations will handle exhaust from shakeout, casting cleaning, chipping, and other dust-raising operations. Collector uses recirculated water and is engineered to individual requirements.

90—Hand removal of cores from large castings is expensive and slow. This Ingersoll-Rand Co. pneumatic core breaker, designed especially for the job, speeds the work and minimizes effort. It is powered by a reciprocating air motor and weighs about 18¾-lb. Operator controls power of the blow by a throttle built into the tool handle.

91—Tumbling produces smooth, clean surfaces, and the peening action tends to neutralize internal strains in the castings. Whiting Corp. tumbling barrels incorporate roller bearings, balanced barrel construction, positive door locks, and other features. A Whiting 1-ton capacity totally enclosed electric chain hoist is used here to lift the cover from the barrel.

92—Chipping and hand grinding operations, done here with Thor Power Tool Co. air tools, are common tasks in almost every foundry. The 12-lb chipping hammer has an over-all length of 13½-in. Grinder is a throttle grip model and will handle 1 x 5-in. vitrified wheels or 1 x 8-in. bonded wheels. It has a speed of 4500 rpm, weighs 16¼-lb and is 20 in. long.

93—Foundry grinding wheels must be dressed to maintain their cutting efficiency, and the operation is shown here with a Desmond-Stephan Mfg. Co. heavy duty dressing tool. Because large size foundry grinding wheels are operated at high surface speeds, it is important that the wheel dresser be equipped with ball bearings, as this one is, to insure satisfactory bearing performance, since cutter spindles are subject to extremely high speeds under these conditions.

94—This Pangborn Corp. blast cleaning ma-

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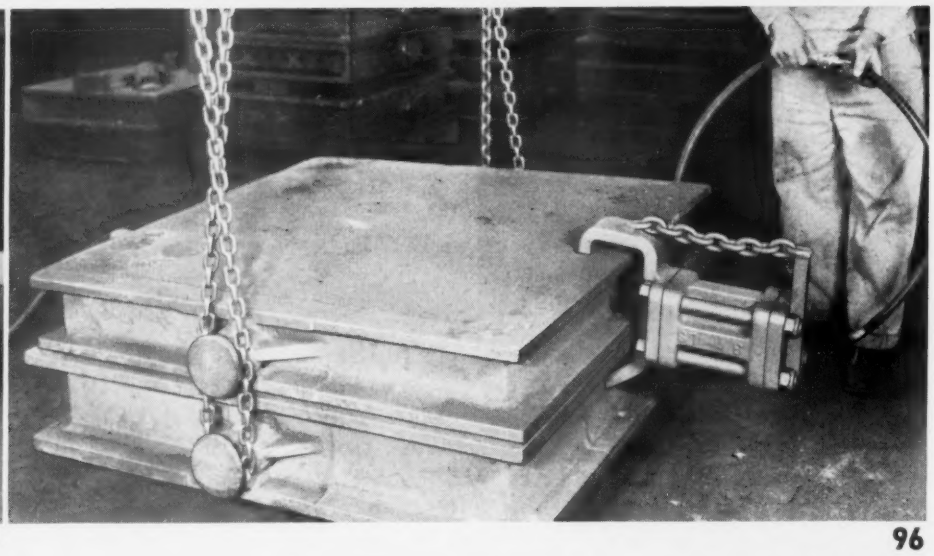

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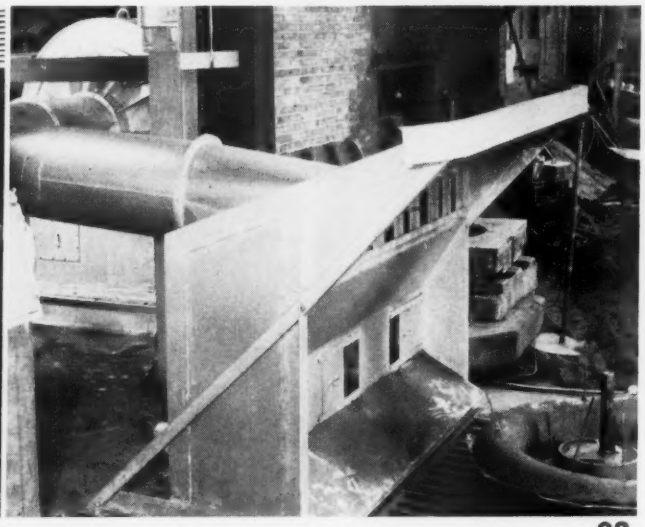

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chine tumbles the castings as it blasts them with shot from a centrifugal wheel. Machines may be loaded by hand or mechanical means, including a skip hoist loader made by the company. To unload, the machine conveyor is run in reverse, spilling castings out to a waiting container. Machine is available in four sizes: To handle 300-lb maximum load of individual castings weighing up to 12 lb; 900-lb maximum with 50-lb pieces; 1800-lb maximum with 100-lb pieces; and 2700-lb maximum with 100-lb pieces.

95—Oxyacetylene torch is used for riser cutting, gouging and pad washing. Lightness of this Air Reduction Sales Co. tool permits it to be carried to the work for cleaning operations, thus reducing materials handling costs. The torch will remove metal protuberances on clean castings without use of iron powder. The same tool, fitted with an accessory unit for powder washing, is used for smoothing out sand encrustments, removing riser pads, sand cores and stress webs on ferrous castings.

96—Simplified casting shakeout is achieved with this pneumatically vibrated device of Cleveland Vibrator Co. Vibrator is available in 3, 4 and 5-in. piston diameters. The hook head is engineered for use on pressed steel or cast flasks of all sizes. Use of the unit is said not to damage flasks.

97—Thor Power Tool Co.'s air-operated core buster weighs 18¾-lb and is designed to ease the work of removing cores from large castings.

98—Centralized location of shakeout operations simplifies control of dust, fumes and smoke through use of a side hood piped to a collector visible at upper left in the illustration. The collector is a dynamic precipitator with a moving water film on the collecting surfaces. This expands its efficiency to the collection of light, fine dust particles, eliminates wear from abrasion and delivers the collected dust as a sludge for easy disposal. The collector is a product of American Air Filter Co. Inc.

Allis-Chalmers Mfg. Co. has developed an automatic snubber control, which eliminates excessive amplitude during stopping of foundry shakeouts and vibrating screens. It acts to bring the mechanism speed rapidly through the range where excessive amplitude occurs. It is said that start and stop cycles can be as frequent as motor design will allow with reduced wear of the drive. Also, damage to castings and flasks is reduced.

99—Baker-Raulang Co.'s 3000-lb capacity fork truck is shown delivering a load of castings from

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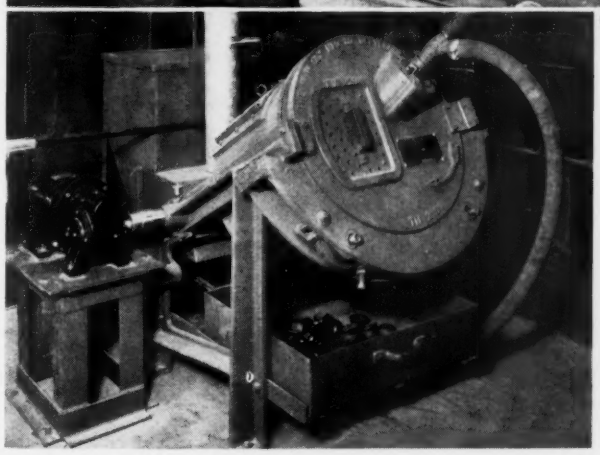

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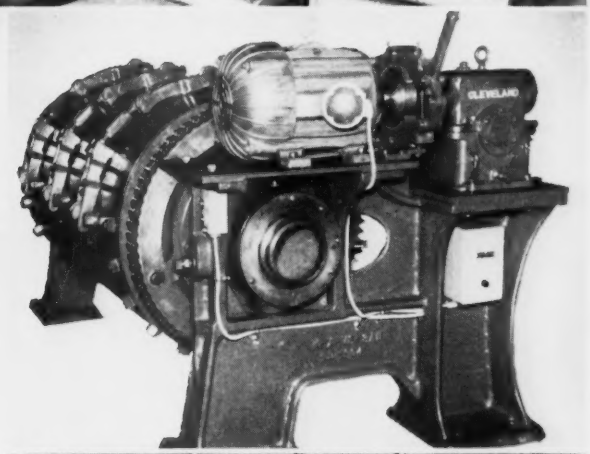

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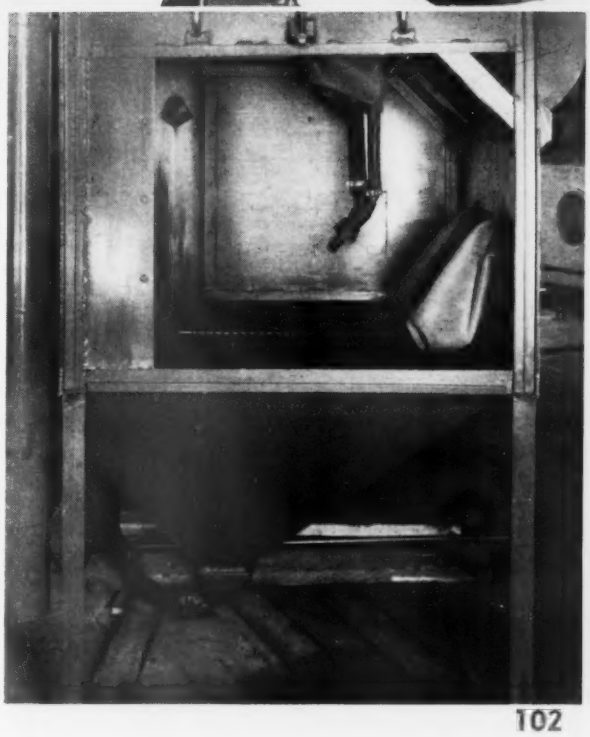

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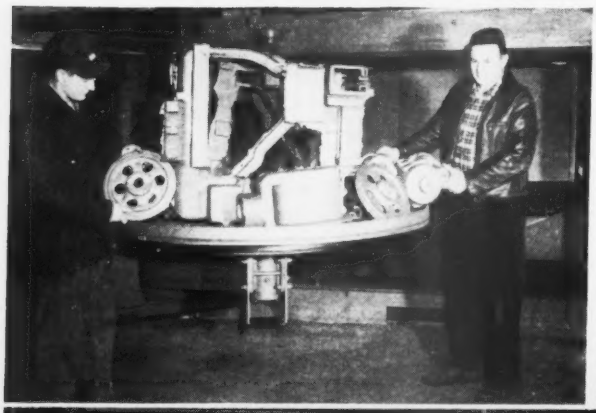
cleaning machine to the inspection department. Previously it had hauled rough castings from shakeout to cleaning department. It will complete the job by moving inspected castings to the shipping room and load outgoing orders on highway trucks. It will haul sand, refuse, equipment and perform a host of other foundry transportation jobs.

100—Designed for cleaning small castings, W. W. Sly Mfg. Co.'s tilted blast mill has a capacity of between 1 and 1½-cu ft. Blasting is done by the induction principle, and a direct-drive gearhead motor rotates barrel during the blasting operation. Castings are loaded through door at mill front and discharged into the lower pan by removing the door on the circumference of the mill and rotating the barrel until the door opening is at bottom. Cleaning time is said to take 10 to 15 minutes.

101—Royersford Foundry & Machine Co.'s roller bearing, unit drive tumbling barrel has extra large trunnions, modern steel door clamps and extra large, self-aligning roller bearings. Loading door runs entire length of mill and dust plates are drilled with small holes over entire diameter of the barrel. Unit shown is driven by an electric motor through speed reducer and has a brake that will stop the barrel in any position. Individual or multiple units driven by clutch and brake, V-belt or flat belt drive are available.

102—Blast cleaning cabinet for small foundry needs is a product of W. W. Sly Mfg. Co. Operator places a number of castings in the blasting chamber at one side, blasts them one at a time, placing them on the opposite side of the chamber. When the load is finished it is removed. Protection is af-



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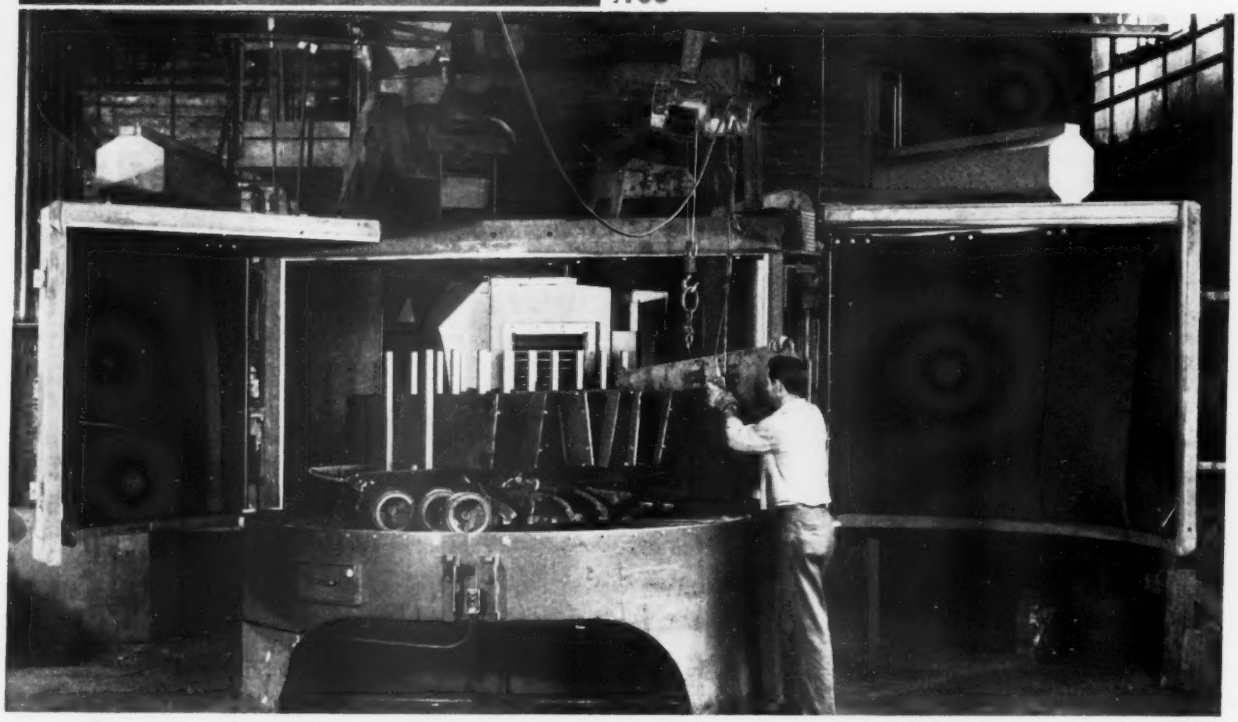
forded the operator as he stands outside the cabinet, inserts his hands into the blasting chamber through a pair of rubber sleeves and wears a pair of rubber gloves during the blasting operation. Blast unit operates on the induction principle.

103—A small gray iron foundry employing four men and averaging 3 tons production per week tripled its production through installation of a swing table airless blast cleaning machine. The 66-in. diam work table is mounted on the door of the machine. When door is opened, work table automatically comes out into the room where it can



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be unloaded and reloaded. As the door is closed, the table automatically moves into the blast chamber. Table rotates the work under the metallic abrasive as it is hurled centrifugally by a wheel in the cabinet roof. Unit is made by American Wheelabrator & Equipment Corp.

104—Another centrifugal blast cleaning room with rotating table is manufactured by Pangborn Corp. It, too, offers substantial time and labor savings. It has two doors, forming half the top and half the circumference of the circular chamber. Thus half the table is cleared for loading by hand or crane. Table may be revolved during loading so that loading area is always in front of operator. Machine is offered in table diameters of 52, 72 and 96 in.

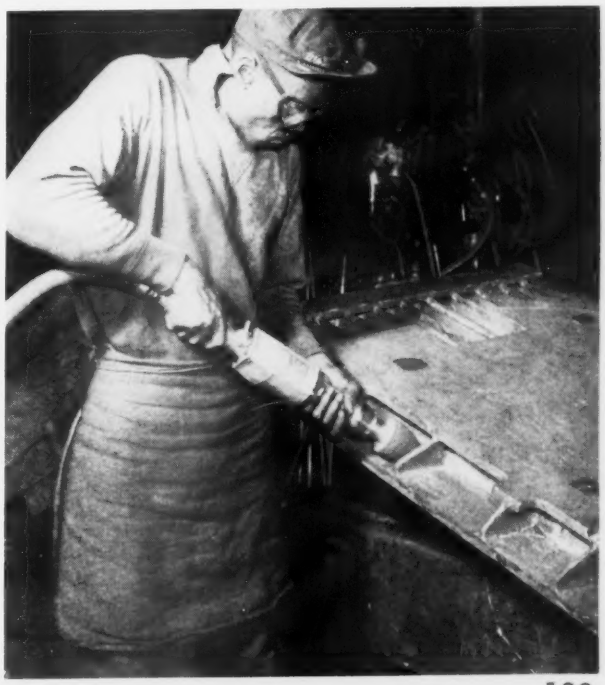
105—Removal of fins, small metal protuberances or burned-on sand from castings is facilitated by the air-operated reciprocating motor chipping tool made by Ingersoll-Rand Co. Tool weighs 3½-lb and is equipped with a lever type throttle, permitting operator to control power and speed during chipping operations.

106—Use of a multivane air motor tool with a 7-in. cut-off wheel for slicing nails off castings is shown here. Tool also will handle a cup grinding wheel. Motor on this 10-lb tool is connected directly to the driving spindle. It operates the cut-off wheels at 6000 rpm when used with air at 90 psi. Tool is equipped with a preset governor which prevents over speeding. Ingersoll-Rand is the manufacturer.

107—Vertical type air grinder fitted with a cup-shaped abrasive wheel is made by Master Pneumatic Tool Co. and is used for removing excess metal from a casting preparatory to machining. A wire brush or sanding pad may be substituted for the abrasive wheel for other cleaning and polishing jobs performed in the foundry.

108—This 2½-in. abrasive belt deburring machine produced by Delta Power Tool Division, Rockwell Mfg. Co., is shown here grinding a hard-to-reach surface on a casting. With this belt grinding, polishing and deburring machine, small foundries can perform many intricate metal-removing operations. Lubricated-for-life, double sealed, preloaded ball bearings, precision bored seats, precision ground shafts and dynamically balanced arbor pulleys are said to assure trouble-free service.

109—A portable grinder with cone-shaped abrasive wheel is well suited for cleaning hard-to-reach casting surfaces. This bladed, rotary type



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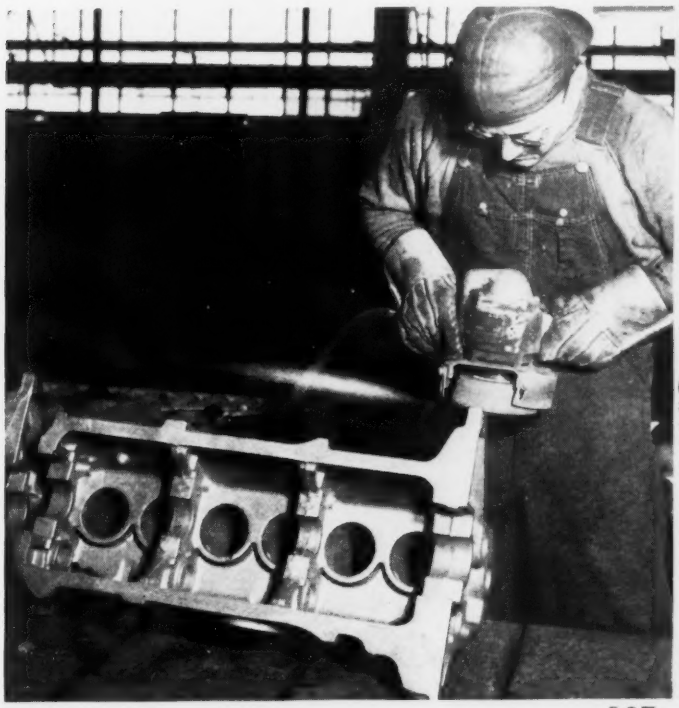

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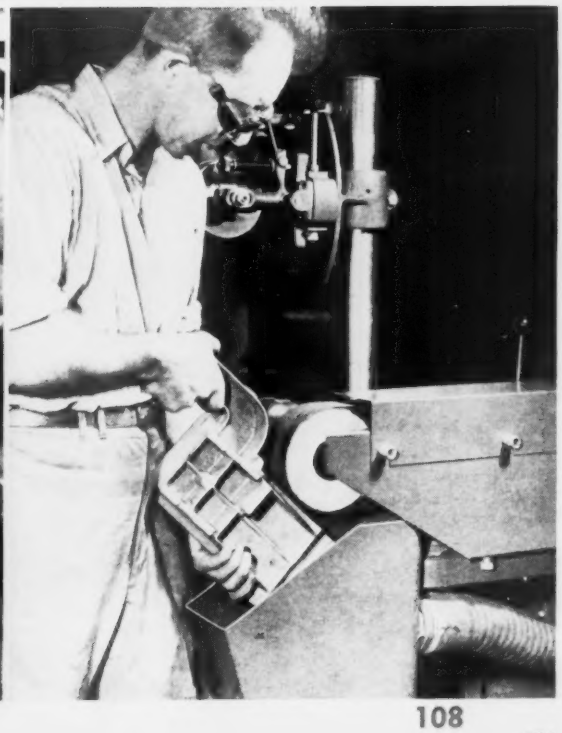

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by Rotor Tool Co. is offered at 8500 rpm for 4-in.-diam elastic wheels and at 6000 rpm for 6-in. elastic wheels and wire brushes and 4-in. vitrified wheels. Both handle 2¾ x 3½ x ⅝-in. cones. Straight handle models are 21½-in. long and weigh 8¼ lb. Grip handle models are 18⅞-in. long and weigh 8¾ lb.

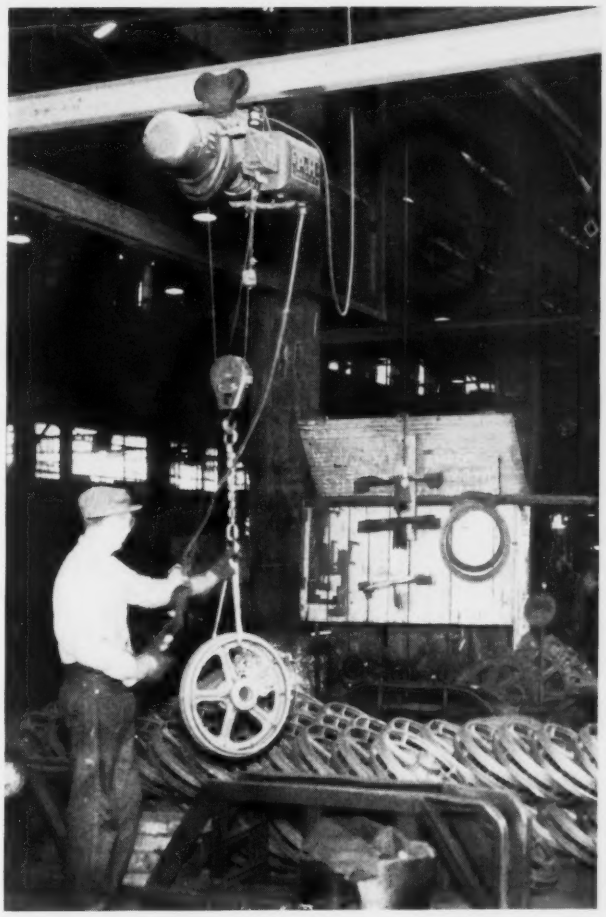
110—Rotor Tool Co. also makes a 40,000 rpm pencil grinder that has a three-bladed motor offering plenty of power for carbide tools. It is useful for finishing work on metal patterns and dies. Tool handles mounted points, carbide burrs or rotary files, weighs 13 oz and is 5¾-in. long. A right angle head is available.

111—Heavy-duty double-wheel grinder by Bradford Machine Tool Co. is available in 1 to 5 hp capacities handling wheel sizes of 12 x 1½-in. to 18 x 3 in. Grinders are equipped with tool tray, water pot, spark breakers, adjustable tool rests, exhaust connections and radially adjustable wheel guards with hinged doors for easy access. Motors are totally enclosed to NEMA specifications, 220-440, 550 v, 50 or 60 c, 2 or 3 phase.

112—Device for holding castings securely for cleaning and snagging operations has been developed by Joy Mfg. Co. It consists of a steel work table on which are mounted specially designed jaws to grip castings of any shape or size from 2 to 20 in. Working jaw is powered by a slow grip, fast release pneumatic cylinder controlled by a single valve.

113—Gasoline-powered fork truck by Clark Equipment Co., Industrial Truck Division, has capacity of 6000 lb at 24-in. load center, turning radius of 85 in. and can stack at right angles in an aisle of 100½-in. plus length of load. In the foundry it can transport pallet or rack loads of cores, handle tote-box loads of castings, load and unload ovens and tumbling or blast cleaning equipment and load finished castings onto highway trucks. Attachments for specialized purposes are available.

114—Harnischfeger Corp. offers electric hoists in a number of different models. Here a ½-ton



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model lifts and positions castings in the cleaning room of a steel foundry. Hoists are available in capacities up to 15 tons and with pendant or electric pushbutton control.

115—Twin motor, double wheel grinders made by Standard Electrical Tool Co. are available for 24 to 30-in. wheels with two 7½-hp to two 25-hp electric motors. Designed for use with resinoid bond grinding wheels, they feature infinitely variable speed control to maintain exactly 9500 sfm (best speed for this type wheel) throughout wheel life. Each wheel on the grinder is operated independently of the other. Three grinders installed in the foundry shown achieved 20 per cent additional grinding capacity with 25 per cent reduced labor cost, longer wheel life and lower wheel cost.

116—Small cavities in steel castings are filled in quickly with the sigma welding tool of Linde Air Products Co. Since no welding flux is used, it is claimed that welds are clean and smooth, requiring no cleaning. With sigma grade argon as the shielding gas, weld spatter is reduced considerably. Welds are left as welded and finished with the rest of the casting during final machining.

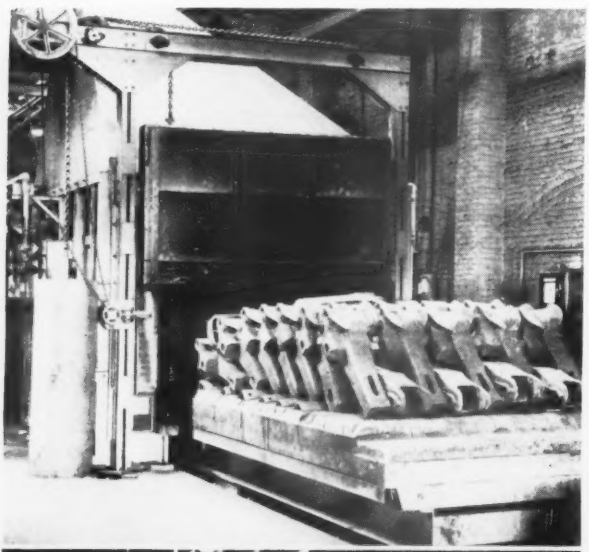
117—Large chunks of metal may be cut into pieces for remelting with the powder-cutting tool produced by Linde Air Products Co. In the illustration a 3-ton manganese-bronze casting 13 in. thick is being sectioned. The tool used oxygen at 60 psi and acetylene at 10 psi. The powder was 85 per cent iron, 15 per cent aluminum by weight.

Related Equipment

118—Flexibility permits this Johnson Mfg. Co. car bottom type furnace to be used for heat treating, annealing or normalizing. It can be operated at temperatures above 1250° F as a standard, direct-fired furnace. At temperatures below 1250° F, the inducer type recirculating system is turned on. It is stated to insure uniform heating throughout the furnace chamber, without hot spots.

119—The fly ash problem is another that affects all foundries, regardless of size. Claude B. Schneible Co. cupola collector installations like this one serve to make foundries good neighbors, to reduce roof cleaning and building maintenance and to prevent fire hazards. This is a wet-type collector which washes out the contaminants and sluices them away to dewatering and recirculating tanks.

120—Small, elevator type General Electric Co. annealing furnaces for iron castings are adaptable for many different types of loadings. Normal loading of castings weighing 105 lb per cu ft is 10,000 lb, provided that castings can be stacked. Usual operating temperatures go as high as 1800° F, and



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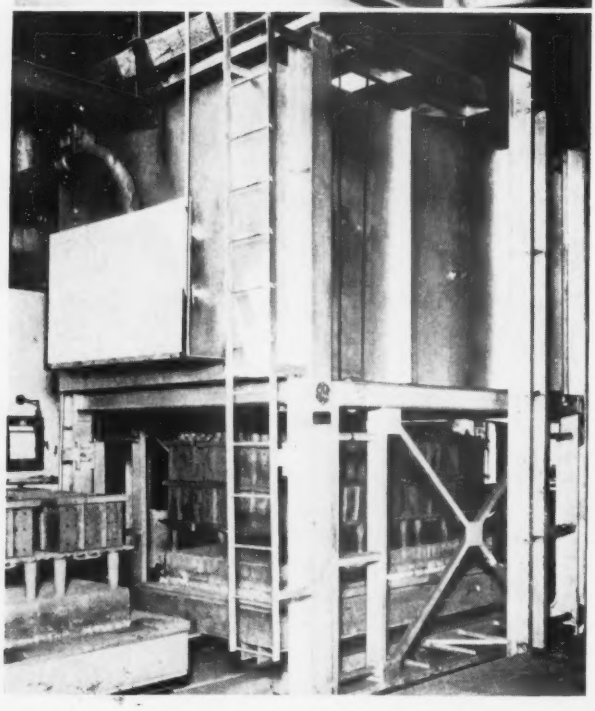

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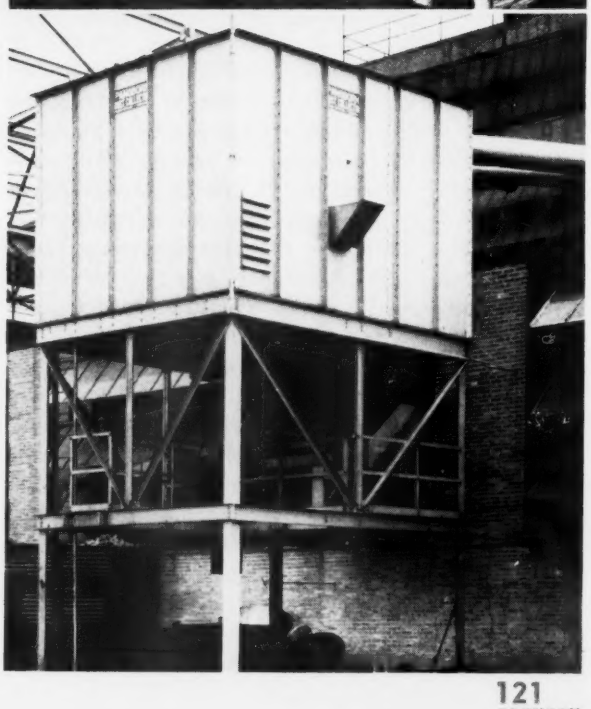

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higher temperatures are possible. Raised hearth construction of the elevator car is reported to assure uniform heating with minimum heat absorption by the car itself. The furnace can be used with or without protective atmosphere.

121—Dust control is receiving increasing attention from foundrymen. Pangborn Co. dust collectors are designed with two thoughts in mind: To do an effective job of removing dust from the air and to use materials that do not require frequent replacement. These units consist of exhaust hoods and piping system, flow producing equipment and the collector itself. They employ filter cloth bags and a rapping mechanism in the collector to insure that only clean air is discharged.

122—Roots-Connersville Blower Corp., a division of Dresser Industries, manufactures both rotary positive and centrifugal cupola blowers. The rotary positive type, illustrated here in a typical installation, is the more common, but centrifugal blowers sometimes are preferable, particularly when space is limited. It handles approximately 440 cfm of air at 20-oz discharge pressure when operating at 380 rpm, requiring about 30 hp. Capacities from 640 to 14,000 cfm are available.

123—Chicago Pneumatic Tool Co. chain hoists have a multitude of small foundry applications. The rotary vane motor operates nominally on 90 lb of air pressure to drive the gearing connected to the load-chain sprocket. Worm gear provides self-locking action. Standard chain length is 12 ft, and standard maximum lift is 10 ft. Minimum hook-to-hook distance is 17 in. Lift speeds range from 70 to 20 fpm on 90 lb pressure for 300, 500, 700 or 1000-lb capacity. Lowering speed is 130 to 42 fpm.

124—The furnace illustrated is used to anneal gray iron castings. A gas-fired pusher type built by Holcroft & Co., it will anneal up to 1500 lb of castings per hour. Castings are loaded on alloy trays and pushed through the furnace on rollers. After stock reaches a temperature of 1400° F in the heating chamber, it enters the slow-cool portion of the furnace. As the castings leave the cooling section, they can be unloaded manually or discharged automatically by a tray tipover device.

125—Mounted on the roof of a foundry building, this W. W. Sly Mfg. Co. dust collector ventilates

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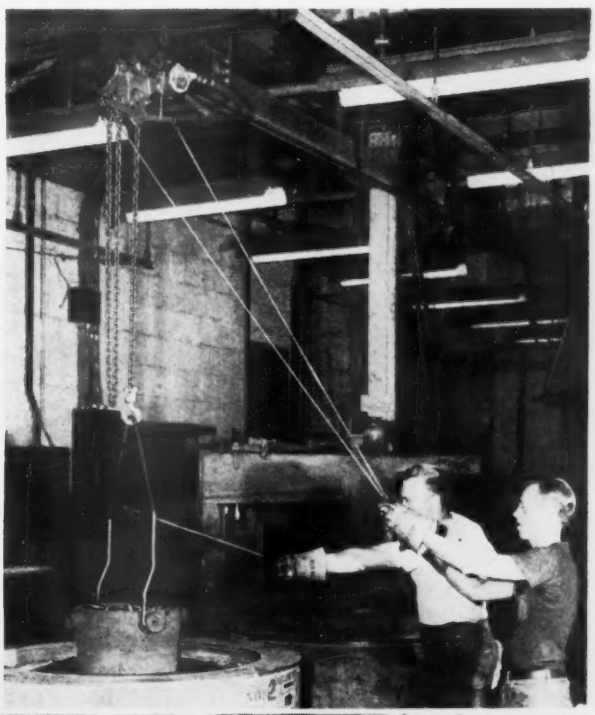

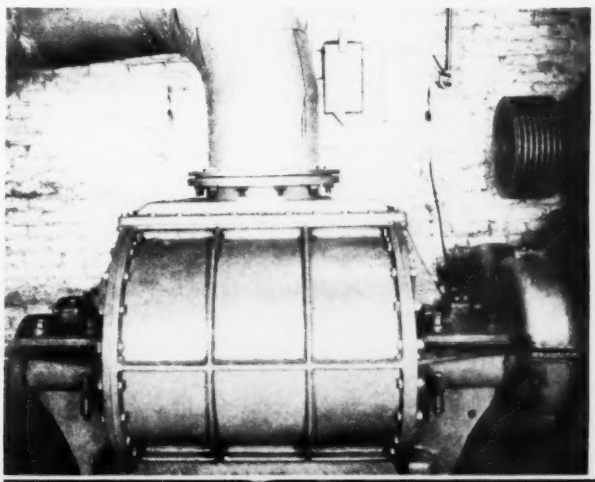

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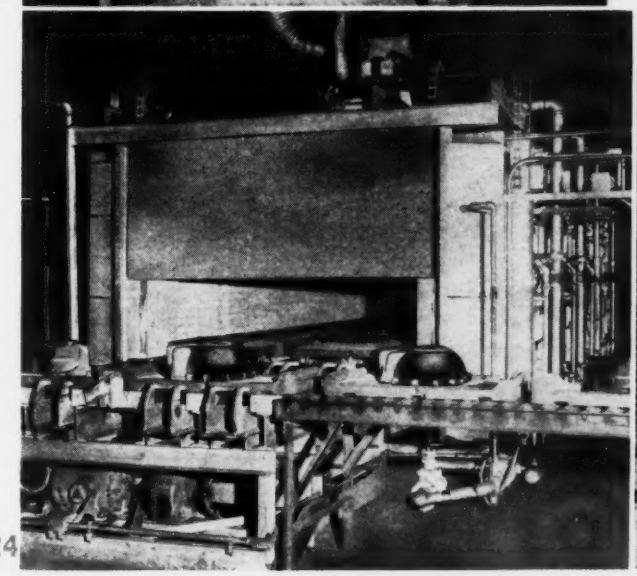

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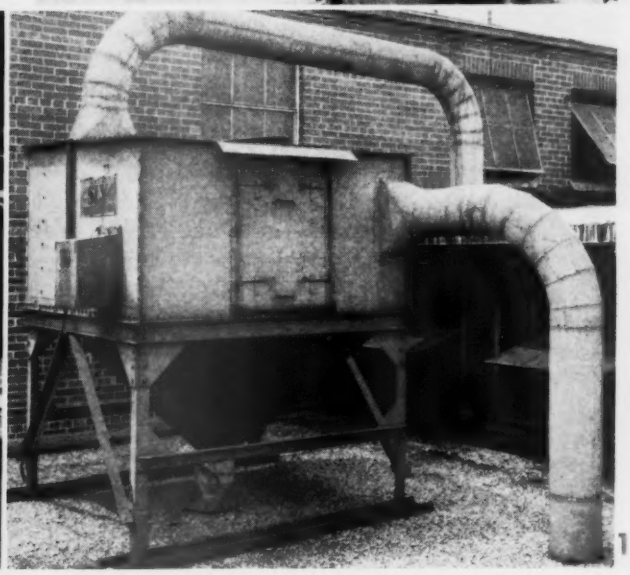

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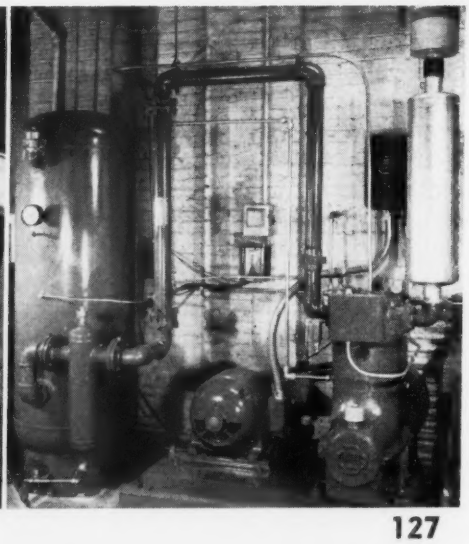

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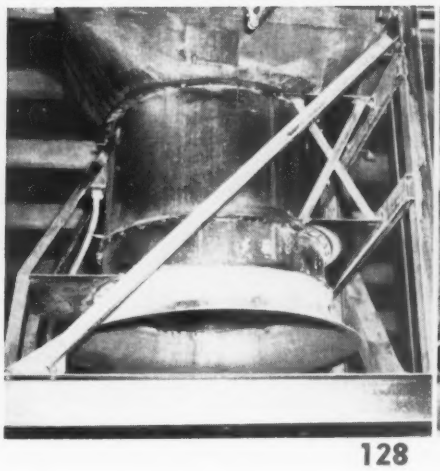

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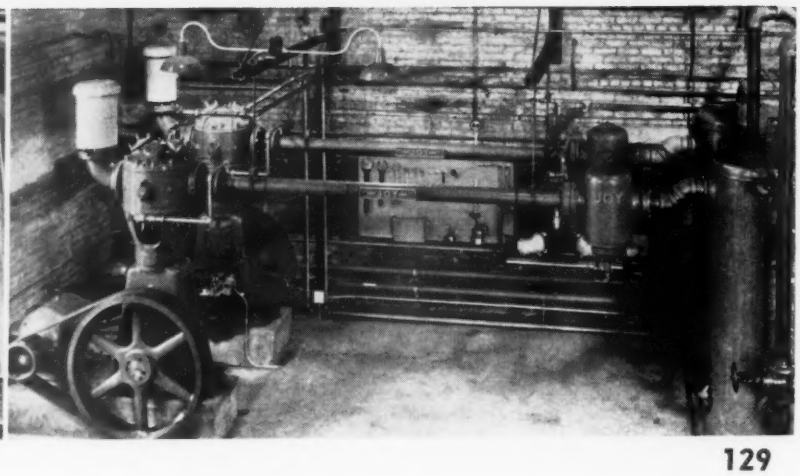

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sandblast equipment and grinders. Filter elements are made of cotton cloth which retains dust so that the exhaust fan discharge is free of visible particles. Small units are available in any size.

126—Industrial vacuum cleaners are invaluable to good housekeeping. Spencer Turbine Co. portable units all roll easily on roller bearing wheels. The dirt can is released by a hand lever and rolls on casters to the disposal point. The extra heavy duty portable machine shown here cleaning a core oven, has capacity sufficient for use by two or three operators simultaneously. Dirt receptacle holds 7½ cu ft.

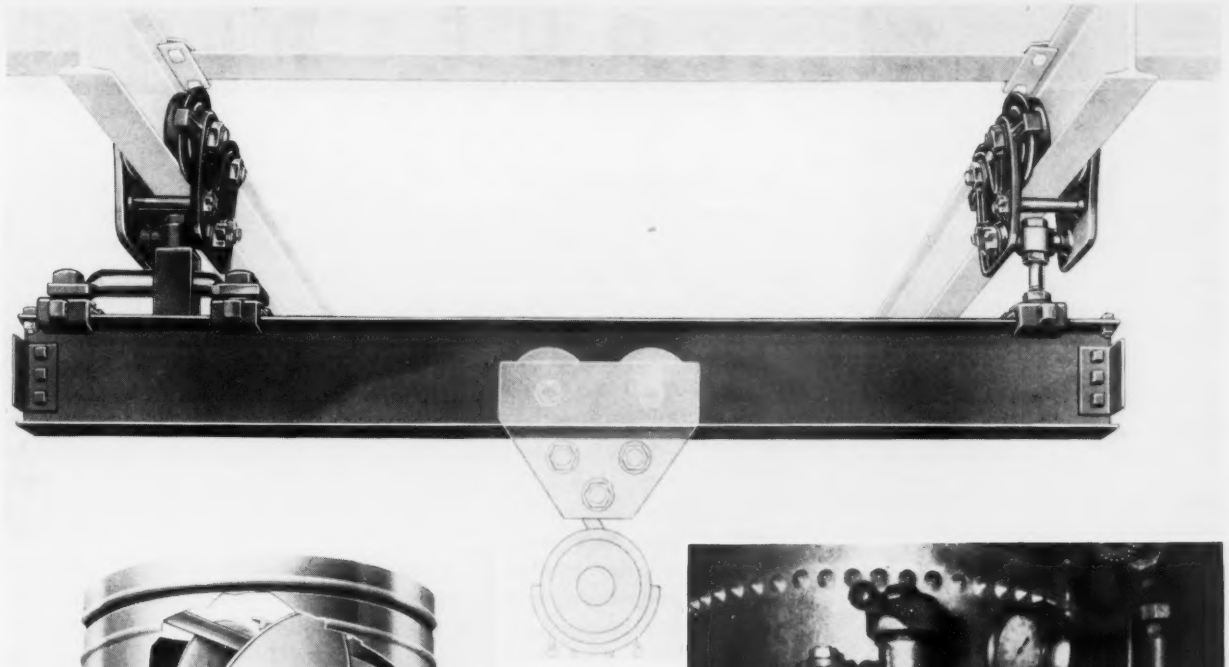
127—Compresed air does a big job in foundries. This installation is used in a nonferrous shop to operate jolt squeezers, to supply air for a supplemental supply to a gas-fired melting pot, to operate a gas-air torch for drying floor molds and to do other jobs. It is a Gardner-Denver Co. single stage, water-cooled model, powered with a 25-hp motor. It operates 16 hr per day on constant speed control service, between 94 and 100 psi pressure.

128—Vaneaxial fans such as this Joy Mfg. Co. installation are compact, lightweight, easily installed units which handle large, varying quantities of air at either low or high pressure. Rotor, blades and straightener vanes are contained in a tubular housing. Straightener vanes restore rotative energy to the airstream and assure a nonturbulent, "straight-through" air flow. A variety of hub ratios makes it possible to select a standard fan capable of satisfying any duty requirement.

129—Compressed air can be used as the power source in such operations as sand ramming, grinding, holding castings, chipping and scaling, blast cleaning and hoisting. The type of Joy Mfg. Co. compressor shown here is available in capacities ranging from 172 to 881 cfm. These units are complete with aftercoolers, for cooling and cleaning air, and with air receivers, storage chambers which serve as surge chambers and give a smooth, steady flow of air into the lines.

130—Richards-Wilcox Mfg. Co. is offering a flexible traveling crane, hand operated, with a bridge that does not move at right angles to the runways. If the load is closer to the pivoted end than to the other, the pivoted end moves slightly in advance of the opposite end, and vice-versa. This arrangement is said to prevent binding. Cranes are made in capacities from 1000 to 8000 lb.

131—Heat, fumes, smoke and dust are shot high into the air by Robbins & Myers Inc. power roof ventilators. Available in 12 to 60-in. sizes, they have air delivery ratings of from 2800 to 80,000 cfm. Dampers close tightly when the fan is off, providing protection against the weather. These



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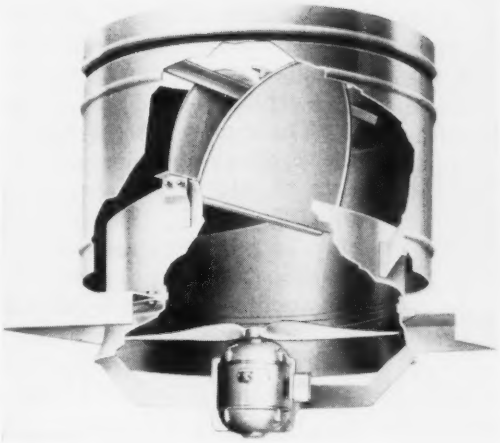

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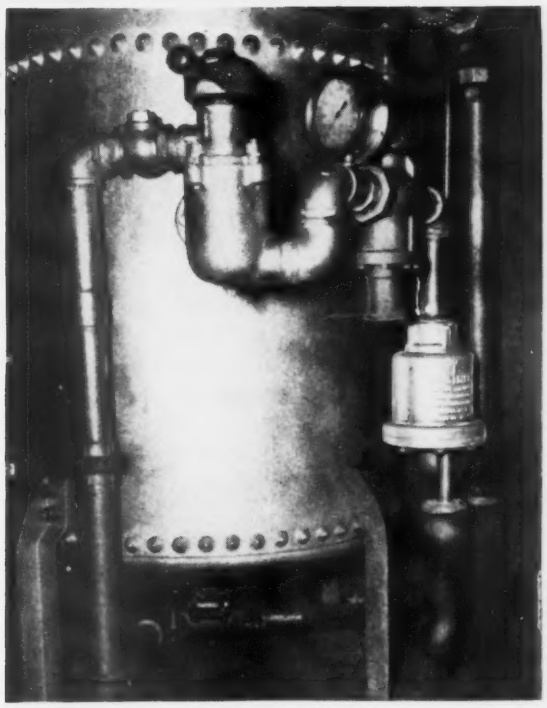

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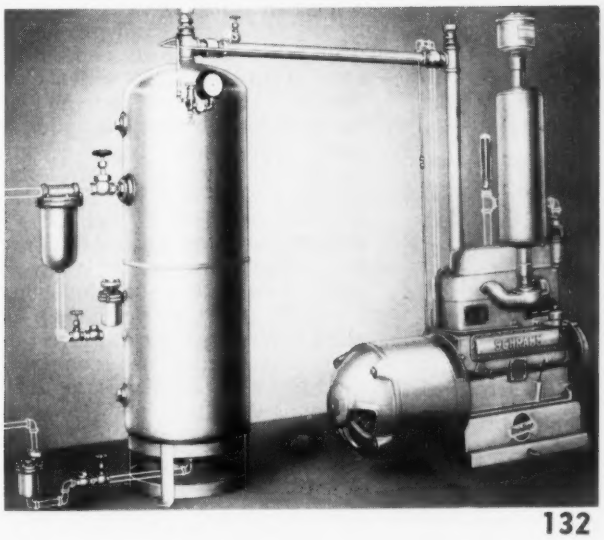

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machines can be mounted on flat, curved, sloped or peaked roofs, without ductwork.

132—The accompanying illustration shows a complete Schramm Inc. installation of an air compressor and accessories. Compressors range from ½ to 100 hp. Accessories include pressure gage, pilot valve, moisture separator, air receiver, automatic trap, air cleaner, aftercooler, intake silencer, thermometer and water funnel. These units are available with either belt or direct motor drives and with manual or magnetic starters.

133—Up to 92 per cent of all oil, water and dirt in a compressed air line is said to be removed by the Logan Engineering Co. device shown here. Air passing through the line causes four multibladed rotors to revolve at high speed in opposite directions to one another. Moisture and heavy solids are thrown to the walls of the device and fall by gravity to a trap or drain.

Aquadyne Corp. offers a wetting compound and a blender to mix it with water as it is required, without pumps, motors or storage tanks. Unit is said to produce "wet water" for such uses as sand conditioning, core mixing, core wash and dust control. The wetting compound reduces interfacial tension of ordinary water and increases the wettability of all types of dust and powdery materials. It is furnished as a solidified cartridge for use in the blender.

QUESTIONS

Cannot enamel all cast irons successfully . . . . . .

Galvanizing procedure . . . . Sand may need moisture

Iron loses strength . . . . . Specifies requirements

Iron for Porcelain Enameling

QUESTION Can you tell us whether a special iron has to be used for making cast iron enamelware, or will regular jobbing shop iron serve?

ANSWER All gray irons are not suitable for production of cast iron enamelware, and those engaged in that field have their troubles. In general it appears that a "soft" iron, that is one fairly high in silicon—around 2.50 per cent—will serve. If any hard or chilled areas are present on the casting, bubbles or pimples will occur in the enamel coating. Those blemishes are believed to result from the evolution of carbon monoxide formed when the cementite breaks down to pearlite or ferrite and graphite at enameling temperatures.

Naturally the surface of the casting to be enameled has to be smooth, since any discontinuities either will not be covered by the enamel or will be reproduced in the coating. Graphitic facing materials generally are not used because they leave a coating which causes trouble in enameling.

Galvanizing of Pipe Fittings

QUESTION We are planning to make nodular iron pipe fittings in a pilot plant in our foundry in Cuba, and wish information about some practical process for coating the fittings with molten zinc by dipping. Amount required is only 500 units per hr in ½, ¾ and 1-in. sizes.

ANSWER By reference to 500 units per hr we assume that you mean castings, and in the 1-in. size the total weight would be about 450 lb. Since this hot-dip galvanizing operation is to be a pilot proposition you probably want to hold amount of zinc, kettle size, etc. to the minimum.

Pipe fittings of the size you mention should galvanize with an immersion under 2 minutes in batches of 20 to 25 lb, and the latter is about the limit one man can handle in basket dipping. Baskets are sheet steel perforated with ¾-in. holes—about 10 in. in diam and 9 in. deep, and equipped with 1-in. pipe handle about 6 ft long with a ring or loop on the end to permit gripping.

While it may be possible for one man to do all the dipping of castings, there may be occasions when two men may be needed, and the opening of the zinc kettle should be such that they can work without interference. With a 10-in.-diam basket a space allowance of 4 in. between two baskets and the sides probably will be sufficient so the opening should be 18 x 32 in. Depth of the kettle should be 18 to 20 in., and the bottom semicylindrical.

Such a kettle will hold about 7000 lb zinc, and should be of heavy steel plate about 1 in. thick. Kettle also should be well supported on brickwork. Burners to heat the kettle should be located so they do not impinge directly on the kettle—preferably baffled so that most of the heat is distributed against the upper third, and passing down the remainder to the exit. Temperature of the bath should be about 850° F.

If the castings peel from the sand freely—that is, have little sand adherence, they probably will be nice and clean after abrasive blasting, and can be fluxed and immersed or dipped in the molten zinc bath without any other operations. However, if sand adheres to the castings after blasting, it will have to be removed by pickling in 10 to 15 per cent hydrofluoric acid and rinsing in running water prior to fluxing.

Flux used today by many is zinc ammonium chloride with organic addition agents known as No. 20 flux. This is used as the first or wash flux, and as a covering for the molten zinc. Flux wash contains from 2 to 3 lb No. 20 flux per gallon, and is used at a temperature of 125 to 175° F. Castings are dipped or immersed in the flux wash for a few minutes, then taken out and allowed to dry before immersing in the zinc bath.

Operator takes a basket of flux-washed castings and immerses it in the zinc for 1½ to 2 minutes, and then quickly raises the basket and "bounces" it up and down for 25 to 30 seconds to remove excess zinc. It should be mentioned here that a railing about 10 in. high near the edges of the kettle aids the operator in raising the basket by lever action, and also in "bouncing" to remove excess zinc. Then the castings are dumped into a bath of cold water covered with a thin film of oil. That cooling results in a bright finish of the zinc coating. Castings are removed from the cooling bath while still warm so that they will dry and retain the desired color.

Sand Mixture Lacks Strength

QUESTION We are casting aluminum as a hobby, but cannot seem to get the right sand mixture. We originally obtained some mixed sand from a foundry which worked fine, but used it all up. Since there is no foundry near we purchased some new sand from a supply house, and added a tradenamed bonding material in the ratio of 5 parts sand to 1 bond, 1 part wood flour, and 4 to 4.5 per cent moisture by guess. This prepared sand does not have the bonding strength of the previously used sand. We are trying to make nameplates, and use considerable parting powder since we do not have a vibrator, and this leaves the castings rough.

ANSWER Presumably your reference to new sand and addition of bonding material means that the sand was free from or contained little bond material. While we do not have definite information relative to the bonding material you mention, we suspect that it is a clay. Your addition of 1 part clay to 5 parts sand by weight figures out to 16.7 per cent clay; this might be somewhat high since the general range

is 10 to 14 per cent, although some natural molding sands run as high as 20 per cent clay. Possibly your mention of 1 to 5 is by volume, and in that case, since the clay is lighter than the sand, the actual clay content may be between 10 and 11 per cent by weight.

However, your trouble with lack of strength in the mixed sand is due to the low moisture content, and we suggest that you increase it. Clay-bonded sands generally are used in the 6 to 8 per cent moisture range to provide workability and develop the bonding power. Since you have no means of determining present water content, we suggest you make the addition gradually by sprinkling a little water over the sand, shoveling it over well, and then trying for bonding strength by whatever method you usually employ. Then keep on until you think it has the desired strength.

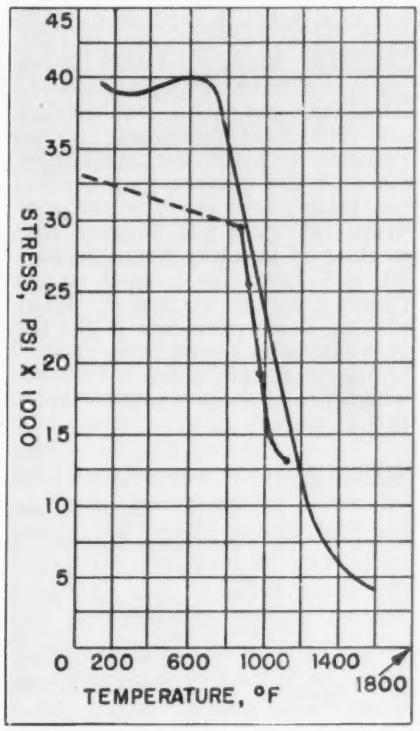
We believe that when your sand is up to proper temper, it will not be necessary to use any parting powder. By careful rapping of the pattern you should be able to draw it from the sand. With letters, etc. on the pattern face you will have to practice to obtain a draw without much disturbance of the sharp edges. We do not believe that wood flour is of much value in sand used for aluminum since the sand generally does not reach a temperature where much expansion occurs.

Elevated Temperature Strength

QUESTION Have you any data on the strength of cast iron at various temperatures? For example, our usual iron shows a tensile strength of about 30,000 psi, and we would like to know the approximate strength of that metal at 600, 800, 1000, and 1400° F. Any help will be appreciated.

ANSWER The only definite way to ascertain the probable tensile strength of your gray iron at given elevated temperatures is to carry on a series of tests which will establish the fact. It will be a range rather than a single value since variations in composition and other factors will have an effect on the tensile strength.

We have no information on an iron of 30,000 psi tensile strength, but in a paper by MacPherran and Krueger in *Transactions* of the American Foundrymen's Society, 1930, reference is made to one with a room temperature tensile of 32,800 psi. Left curve in the accompanying illustration was heated for 500 hr at 20° above the following temperatures, at which tensile determinations were conducted—850, 900, 950, 1000 and 1100° F. You will note that at 850° the tensile



Curves showing strength decrease with an increase in temperature

has decreased nearly 9 per cent, and drops rapidly until 1100° is reached, where it appears the rate of decrease is not so rapid.

Curve at right is from a recent paper by Vandeventer and McFarland presented at a meeting of the Society of Automotive Engineers. It relates to a cylinder iron with a room-temperature tensile of 39,000 psi which was heated for 30 minutes at 200, 400, 600, 800, 1000, 1200, 1400, and 1600° F. As in the case of the other iron, this one shows the same rapid decrease in tensile strength as the temperature increases.

Iron Must Meet Requirements

QUESTION We have a prospective customer listing requirements for refrigerator castings such as heads, cylinder boxes and covers weighing from 1 to 20 lb as 25,000 to 30,000 psi tensile strength, and 160 to 200 Bhn. Castings must withstand operating pressures around 200 psi. Greatest quality stress would be closeness of grain structure, machinability using high-speed tools, and closeness to dimensional tolerances. Since we can produce by the shell molding process we can secure the desired dimensional requirements, but we would like information on the iron composition to meet the others. Also would we need the services of a metallurgist at all times to maintain specifications? When proper cupola and ladle additions are once established with a specified pig iron, etc., would the factors remain close enough for constant product production?

ANSWER While no mention is made of the section thickness of the castings involved, we suspect that it ranges from ½-in. down, and the specification on tensile strength and brinell hardness number is based on the standard 1.2-in.-diam test bar. The other factors of machinability, closeness of grain, and pressure resistance are based upon the castings. Hence, you will have to engage in some experimental work to correlate the various phases involved.

It is our opinion that to meet the specifications on all points, it would be advantageous to obtain the services of a metallurgist who would not only supervise this particular run of work, but also all other work, and over a period of time propose improvements in methods and practices which will result in savings many times his salary.

Due to the variations from foundry to foundry in raw materials, melting and molding practices, it is impossible to state that

any given gray iron composition will produce the same results in all shops. All that can be done is to suggest a possible starting point or base upon which adjustments can be made to bring tests and product within the desired scope.

It would appear to us that a gray iron with a carbon equivalent around 4.3 would satisfy the requirements set forth. The carbon equivalent, as you know, is equal to the sum of the total carbon (TC) plus 1/3 Si plus ¼ P (some prefer TC plus 1/3 Si plus 1/3 P), and with three variables involved, several compositions can be evolved. For example, we suggest you try a composition showing 3.40 per cent TC, 2.30 per cent Si, 0.50 per cent P, and 0.7 per cent Mn, and see what results are obtained. From those figures adjustments can be made in composition by changes in the charge or by additions in the ladle.

With reference to your remarks about setting up a standard cupola charge, it might be pointed out that one seldom has sufficient supplies of pig iron, coke, and scrap to run day after day without making a change—for example, a new lot of pig, etc. Hence, some type of control test should be established which will indicate that the iron over the spout is within the desired limitations. For example, a number of foundries employ a chill test in which the depth of chill in the bar is correlated with the castings being poured. The test specimens may be in the form of wedge bars poured in core molds, or of small plates cast against a chill. Test is simple to perform and serves as an excellent guide.

Abrasive-Coated Stair Treads

QUESTION We have an inquiry for some cast iron stair treads with an abrasive surface, and we will appreciate information on what material is used and how it is applied to the surface of the treads.

ANSWER Making of abrasive coated castings requires some skill and practice. Essentially the procedure is to make the mold as in the case of a plain casting, spray the desired face with some type of adhesive, screen on the abrasive material, skin dry the mold face, close and pour.

A number of adhesives are employed to hold the abrasive in place. They include thin clay wash, molasses water, sodium silicate or waterglass, sulphite liquor, etc. Face of the mold is sprayed just sufficiently to hold the abrasive in place. Abrasive usually is 30 mesh silicon carbide grain, but may be coarser or finer. It is placed in position by shaking through a screen or sieve of the same mesh as the grain to obtain a thin uniform layer.

After the abrasive is placed, the mold face is skin dried with a torch to remove any moisture that might cause blows or kickbacks from the molten metal. Iron should be as hot as possible when poured into the mold.

Control Pattern Temperature

QUESTION In our foundry in the Netherlands the pattern plates are heated by gas, using two or three jet burners. Sometimes we get castings with too rough a surface since, if the pattern gets too hot, the facing gets too dry and some drops off. Can you suggest some method of keeping the patterns at 40° C? They are located on jolt type molding machines. Would placing thermoelements in the pattern plates and connecting them to temperature indicators on the wall which the operator could watch, be satisfactory?

ANSWER Since you evidently are interested in continuing use of gas for heating the plates, we suggest that you experiment with the "bulb and bellows" type of burner control which commonly is employed to regulate the oven temperature in kitchen gas ranges. Another arrangement would be a thermostatic element in the plate which operates a magnetic valve in the gas line to the burners. If electricity is available at a reasonable cost you could install electrical heating elements equipped with thermostatic control in the plates.

Your suggestion of electrical temperature indicators to each machine would be all right, provided the machine operator pays sufficient attention, and makes burner adjustments accordingly. It appears to us that such a procedure might be somewhat expensive in having to have an electrical temperature meter or indicator for each machine. Possibly you might be able to use a bi-metallic temperature indicator located on each plate.

Castings' Production Manpower

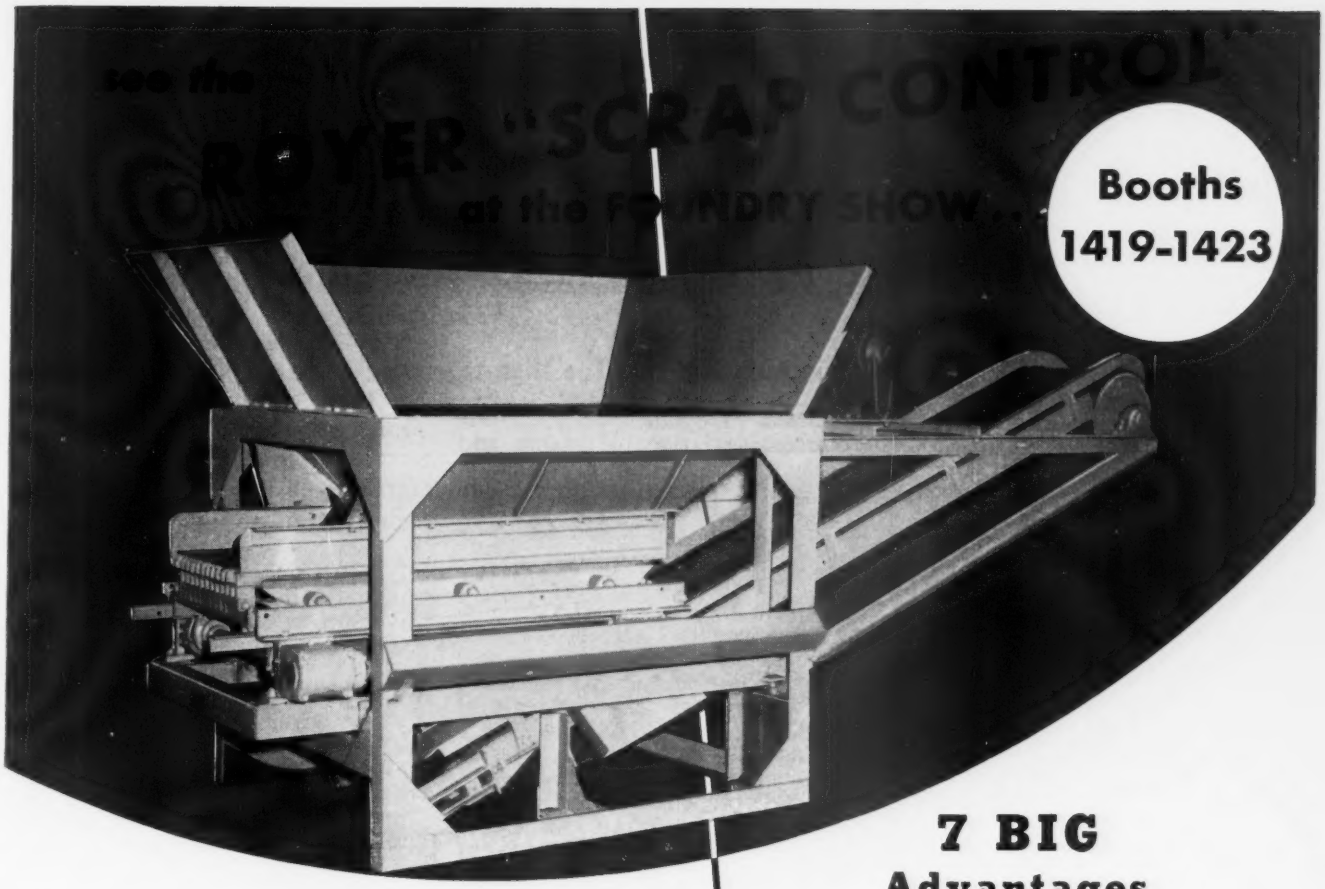
QUESTION We would like an answer to a question which we believe is in the mind of every cost-conscious foundryman. Is there any way of determining how many employees should be required in a foundry to produce 1) 10 tons of gray iron castings, 2) 25 tons, and 3) 50 tons per day? If there is no set rule, can you give an average throughout the country. If possible please stipulate the number of employees needed to produce 50 tons per day in each of the following departments: Coremaking, molding, cleaning, shakeout and sand preparation, melting and pouring, charging and iron pile, pattern shop, and supervisory.

ANSWER The only figures we know of which might answer some of the questions you raise are those presented in a British report on the visit of one of their "productivity teams" to the United States in 1950, entitled "Productivity Team Report Gray Iron Founding." Possibly it may be obtained from the Anglo-American Council on Productivity, 2 Park Ave., New York.

On page 86 of the report, figures based on the Bureau of the Census 1947 *Census of Manufactures* show a production of 51.5 lb of gray iron per man-hour, but mention also is made that the Gray Iron Founders' Society indicated the average rate is about 38 lb per man hour. On page 92, some other figures are given which show the man-hour production ranging from 22.8 lb for printing press, hydraulic press and machine tools to 67.2 lb for small engineering components, tappets, etc.

A table is presented on page 91 showing the approximate percentages of total personnel employed in different departments as follows: Executive and staff—5 per cent; supervision—5 per cent; melting department—5 to 10 per cent; laboratory—1 to 3 per cent; molding 20 to 25 per cent; coremaking—10 to 20 per cent; cleaning and finishing—15 to 20 per cent; inspection and shipping—2 to 3 per cent; pat-

(*Concluded on page* 202)



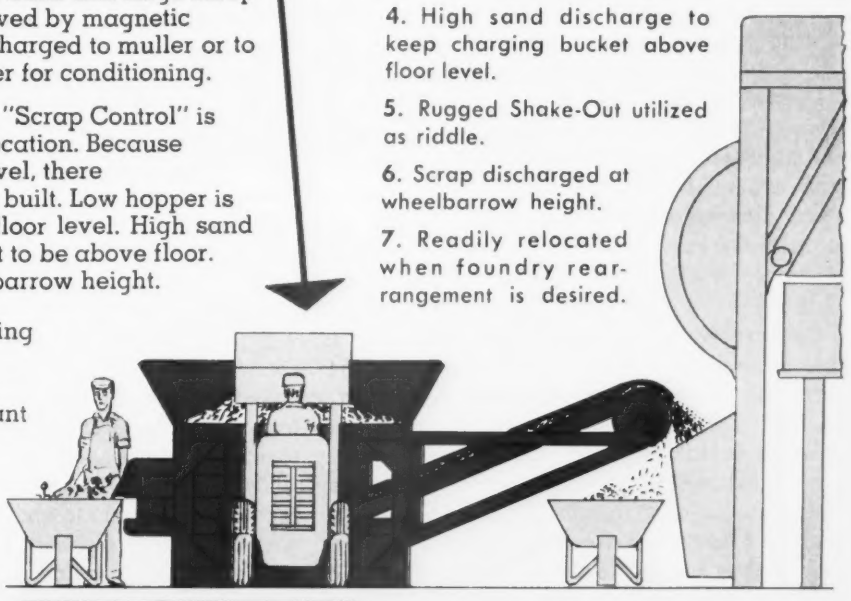
7 BIG Advantages

1. Clean sand at 60 tons per hour.
2. No pits, no excavating. All equipment above floor level.
3. Low receiving hopper for front end loader feeding.
4. High sand discharge to keep charging bucket above floor level.
5. Rugged Shake-Out utilized as riddle.
6. Scrap discharged at wheelbarrow height.
7. Readily relocated when foundry rearrangement is desired.

Designed for use as part of a centralized sand conditioning system, this high capacity (60 tons per hour) Royer "Scrap Control" does a complete job of sand cleaning. Dumped into a large three-sided hopper by front end loader, sand falls onto a Royer Shake-Out where core butts and large scrap are riddled out. Fine scrap is removed by magnetic separator and trash-free sand is discharged to muller or to a Royer Sand Separator & Blender for conditioning.

A major feature of the Royer "Scrap Control" is its ease of installation and relocation. Because all of the equipment is above floor level, there are no costly pits to be built. Low hopper is easily fed by loaders operating on floor level. High sand discharge allows charging bucket to be above floor. Scrap is discharged at wheelbarrow height.

See the "Scrap Control" working at the Foundry Show, Booths 1419-1423 . . . just as it would be in your own plant . . . or write for complete information.



Export Department, 306 W. Washington Blvd.
Chicago 6, Ill., U.S.A. Cable: ASMAN

Foremost in Sand ROYER *Conditioning Equipment*

ROYER FOUNDRY & MACHINE CO. 159 PRINGLE ST. KINGSTON, PA.

(*Concluded from page 200*)
tern department—1 to 7 per cent; yard—1 to 3 per cent, and mechanical or maintenance—3 to 6 per cent.

Those figures indicate that the manpower to produce 50 tons of gray iron castings per day will range from 37 to 110, and a rough estimate of men in specific departments can be determined from the percentage table given. However, any sound conclusions would require more accurate data on molding equipment to be used, size and weight of castings, amount of core work, pattern equipment, cupola charging method, etc.

Wants Data on Permanent Mold

QUESTION We will appreciate any information on a permanent mold for casting slippers used in rolling mills. We are making them in sand, but understand that some are made in cast iron molds.

ANSWER Essential point in making a permanent mold is to design it so that progressive or directional solidification of the casting occurs—that is, freezing begins at those points farthest from the gate and gradually progresses to the gate which is last to freeze.

The same principle is employed with any other molding method. To apply it the molds usually are arranged so that the heavy section of the casting is on the parting line and can be fed directly from the gate. If this cannot be done, arrangements for developing high cooling rates in the heavy section area are made by use of an air-blast, attachment of ribs or studs to increase surface radiation, use of copper inserts, or a combination of these.

Conversely, where the section is thin the back of the mold is lagged with asbestos or other insulating material to reduce heat losses, or in some instances additional heat is supplied to the mold back by gas burners. Rule of thumb for mold thickness is three to four times that of the casting thickness, but that seldom can be accomplished for various reasons. Usually the minimum thickness is $\frac{5}{8}$-in. to provide the necessary rigidity, and since the parts of the mold have to be moved in and out, they cannot be too heavy.

Gates to the mold cavity generally are arranged so that the metal enters with the least disturbance and turbulence, and bottom gating seems to work well. However, top gating sometimes is employed when shrinkage difficulties and tears are encountered. Various gating systems are used and include slot gates, fan gates and finger type.

Limestone Addition Too High

QUESTION We will appreciate your comments relative to fluxing and slagging of our cupola, which is lined to 42 in. Air supply is 3500 cfm at 14 to 18 oz. Front slagging is employed, and lately our slag is running thick and slow. Charges weigh 1000 lb with 140 lb coke splits. Melting rate varies from 5 to 8 tons per hr. Limestone of good grade is employed at 60 lb per charge. Slag is more on the black side with occasional interlacing of green. It is not likely that we are oxidizing the metal since cupola handbooks advise a larger blower. Bed is deep enough and coke splits are sufficient. Scrap charged is miscellaneous cast including occasional motor blocks.

ANSWER It appears that you have rather a wide spread in melting rate since it varies from 5 to 8 tons or about 60 per cent, which makes control difficult, to say the least. On the basis of your figures you are burning 23.3 lb coke per minute when melting 5 tons per hr, and 37.3 lb of coke when the rate is 8 tons. Assuming that 136.5 cu ft per minute of air are required to burn 1 lb of 90 per cent carbon coke, the amount of air required will range from 3180 cfm per minute at 5 tons per hr to 5091 cfm when the melting rate is 8 tons per hr. Hence, in one case the blower is supplying about 10 per cent more air than required while in the other it is supplying only about 69 per cent of the air required. Hence, it is suggested that you try to obtain a more uniform melting schedule.

While the large variation in melting rate undoubtedly has some effect on the slag, your main difficulty is that you are using twice as much limestone as is usually employed. General practice is to use about 3 per cent of the weight of the metal charge which in your case with 1000-lb charges would be 30 lb of limestone. If your purchased scrap is clean and free from rust, and your foundry returns abrasive blasted to remove any adhering sand, the amount of limestone can be reduced to 25 or even 20 lb per charge.

Use of the lowest amount of limestone which will provide a satisfactory slag has several advantages. It may be possible to reduce the coke, since part of it supplies heat to calcine the limestone; less slag will be produced, and erosion of the refractories in the melting zone will be reduced to a considerable degree.

Derivation of Foundry Terms

QUESTION As a foundryman calling on the trade and using common foundry expressions, questions often are asked as to the meaning of or how the following terms came into being: Cope half, cheek, drag half, gating or gates, scab, and buckle. Any explanations will be appreciated.

ANSWER Indications are that the word "cope" appears to be derived from the medieval Latin *cap* or *cappa* meaning a cape or cover as well as the top or uppermost part. One definition for "cheek" is that it applies to pieces of a machine or of any timber or stone work which forms corresponding sides or which are similar or in pairs as cheeks (jaws) of a vise, etc., and early reference is made to the cheek as being the section of a flask so made that it can be moved laterally to permit removal of the pattern from the mold. Presently the word refers to those sections of a mold between the drag and cope.

The word "drag" may be derived from the old Saxon, *dragan*, meaning to bear or carry, whence its application to the lower part of the mold which bears or carries the cope section. "Gate" appears akin to the old Saxon, *gat*, which means an opening or hole. Presumably the term "scab" is based on its appearance similar to the incrustation commonly called a scab on a sore or wound.

The word "buckle" means among other things a bend or kink, distortion, bulge, and in that sense is quite descriptive of the appearance of a casting surface or mold surface resulting from sand expansion trouble.

Intricate Castings Like this call for Neville Pig Iron

TRACTOR transmission castings like the one shown above have to stand up to years of rugged service. That's why the Lynchburg Foundry Company, Lynchburg, Va., insists upon malleable pig iron that meets rigid specifications for uniform composition and high quality. To meet these requirements, Lynchburg uses *Neville* Pig Iron to cast transmission cases, flywheels, crankcases, oil pans, brake drums and other cast products. • If your casting requirements are strict, it will pay you to specify *Neville* Pig Iron. Write, wire or phone for more facts today.

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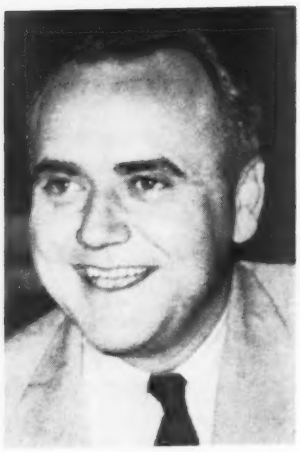
MEN OF INDUSTRY



WILLIAM J. PHILLIPS
. . . Crawford Steel v.p.

G. DEAN LEACH
. . . joins Aluminum Alloys

DOUGLAS L. BUSS
. . . president, Dietert Co.

H. E. FELLOWS
. . . joins Davenport Machine

WILLIAM J. PHILLIPS has joined Crawford Steel Foundry Co., Bucyrus, O., as vice president-general manager, following 3 years as head of the sales organization, Crucible Steel Castings Co., Cleveland. Mr. Phillips attended Albright College and Pennsylvania State College and has a broad background of management and production experience. He was formerly associated with Steel Founders' Society of America as director of product development and with Symington-Gould Corp., Rochester, N. Y., as assistant general manager.

♦ ♦ ♦

G. Dean Leach recently resigned as chief metallurgist of the aluminum division, Howard Foundry Co., Chicago, to accept a similar post with Aluminum Alloys Corp., Detroit. Mr. Leach previously held the following positions: manager, Metal Engineering Co., Mitchell, Ind.; assistant foundry superintendent, Burndy Engineering Co., New York; superintendent, Parkway Foundry & Machine Co., Brooklyn, N. Y.; metallurgical section head, Works Laboratory, Sperry Gyroscope Co., Great Neck, L. I.; chief metallurgist, Hills-McCanna Co., Chicago; and foundry metallurgist, Bohn Aluminum & Brass Corp., Detroit.

♦ ♦ ♦

Douglas L. Buss, formerly executive vice president-treasurer, Harry W. Dietert Co., Detroit, was recently elected president. He succeeds **Harry Dietert,** who was named board chairman. Mr. Buss, who attended Franklin College, joined the company in 1944. He was previously associated with U. S. Radiator Corp., and Kelsey-Hayes Wheel Co., Detroit. **Frank S. Brewster** has been elected vice president and general manager of the company, which he joined in 1946 as technical representative. A graduate of Michigan State College, Mr. Brewster was formerly in sand and metal control at the Saginaw Malleable Iron Plant of GMC, Baker-Perkins Inc., Saginaw, Mich., and Dow Magnesium Foundry, Bay City, Mich. **Jess Toth,** former secretary, was elected secretary-sales manager for the company. Mr. Toth attended Detroit Institute of Technology and joined the Dietert company in 1934. He is a former chairman of the Detroit Chapter of the AFS. As company chairman, Mr. Dietert will be enabled to devote more time to developments pertaining to the foundry industry.

♦ ♦ ♦

H. E. Fellows has been appointed manager, Foundry Equipment Division, Davenport Machine & Foundry Co., Davenport, Iowa. In 1952 Mr. Fellows joined Lester B. Knight & Associates Inc., Chicago, and last year became vice president in charge of its survey division. He was associated with Sampson Tractor Co., Webster Electric Co., Racine, Wis., and Milwaukee Foundry Equipment Division, SPO Inc., Milwaukee, until 1946, when he became engaged in designing special equipment and foundry consulting work.

♦ ♦ ♦

Charles W. McLennan has been elected vice president-director, and **Lloyd C. McNeill,** general manager-director, Lynchburg Foundry Co., Lynchburg, Va., filling positions held by the late Max Kuniansky. Mr. McLennan joined the company in 1933 and has been personnel director since 1939. Mr. McNeill, who has been assistant general manager since 1951, entered the company's time study department in 1934. **Paul E. Sackett,** vice president, Lynchburg Trust & Savings Bank, was also elected a director. Other company officers were re-elected. Henry E. McWane is president.

♦ ♦ ♦

Joseph M. Schaeffer, formerly vice president, has been elected president, Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., succeeding **Richard L. Wilcox,** who has become chairman of the board. **David C. Griggs,** retiring chairman, will continue as a director. **Fred S. Van Valkenburg** and **Irving H. Tolles** were re-elected vice presidents, and **Richard C. Bannon,** Cleveland office sales manager, has been named a vice president. **A. Dale Mitchell** has been elected company treasurer, succeeding **Lewis S. Reed,** who has retired.

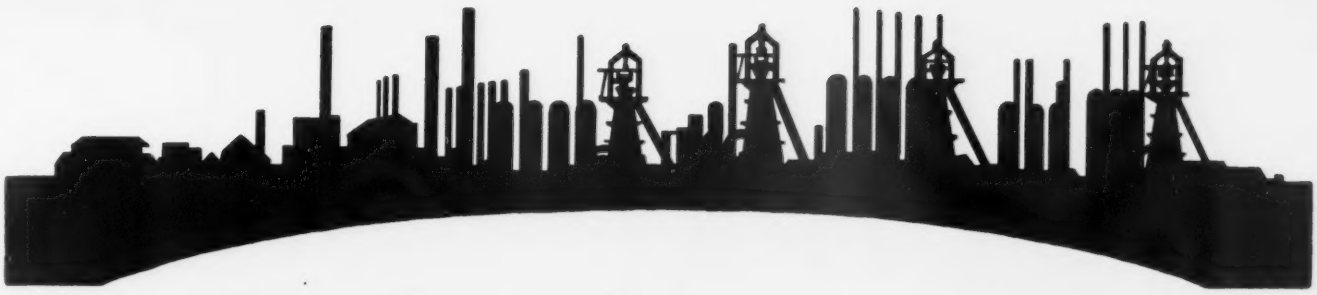
♦ ♦ ♦

R. G. Parks was elected treasurer, and **Roy Willison,** controller, National Malleable & Steel Castings Co., Cleveland, at the company's annual meeting. All other officers were re-elected. Mr. Parks joined the company in 1944 as controller. Mr. Willison, with the company since 1937, has been assistant controller for 3 years.

♦ ♦ ♦

F. Jerome Tone Jr., since 1942 director and vice president in charge of sales, the Carborundum Co., Niagara Falls, N. Y., has been made senior vice president. A graduate of Cornell University, Mr. Tone joined the company in 1926 and was previously general sales manager of the

(Continued on page 206)



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Woodward Iron Company

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MEN OF INDUSTRY

JOHN L. MECKEL
. . . A-D-M sales, Chicago

KEMPTON DUNN
. . . pres., American Brake Shoe

E. L. SHAUGHNESSY
. . . Minneapolis sales, A-D-M

DONALD W. WALKER
. . . Kaiser product mgr.

(*Continued from page* 204)

Grinding Wheel Division. **Frederick T. Keeler** has been named director of company sales. Mr. Keeler was graduated from Hamilton College and Harvard Business School and was appointed a sales analyst for Carborundum Co. in 1943. Since 1950 he has been director of marketing.

♦ ♦ ♦

John L. Meckel, since 1951 sales representative in the Minneapolis area for the Foundry Products Division, Archer-Daniels-Midland Co., Cleveland, has been transferred to Chicago. After joining the company in 1949, Mr. Meckel spent two years in the Minneapolis laboratory of the company. **E. L. Shaughnessy,** who is in charge of sales in the Milwaukee office, will cover the Minneapolis area as well as Wisconsin. He joined the company in 1945 and for 3 years was in its Central Research Laboratory.

♦ ♦ ♦

Kampton Dunn, since 1952 first vice president-director, American Brake Shoe Co., New York, was recently named president, succeeding **Maurice N. Trainer,** who has become vice chairman. Mr. Dunn joined the company in 1932 following graduation from Yale University. He became treasurer in 1942 and was also secretary from 1947 to 1949, when he was made a vice president. Mr. Trainer, a graduate of University of Pennsylvania, has been with the company since 1916. In 1938 he was named president, Brake Shoe and Castings Division. He was elected first vice president of the company in 1943 and has been president since 1950.

♦ ♦ ♦

Donald W. Walker has been named product manager for pig, ingot and billet, Kaiser Aluminum & Chemical Sales Inc., Oakland, Calif., with headquarters in the product office, Chicago. A graduate of University of Illinois, Mr. Walker joined the company in 1947 and previously served on the Chicago and Milwaukee sales staffs and as Minneapolis branch representative. **A. V. Lorch** has succeeded Mr. Walker as assistant product manager for pig and ingot. **Charles B. Willmore,** formerly alloys division metallurgist, has been appointed technical specialist for pig, ingot and billet, with headquarters in the Cleveland office.

♦ ♦ ♦

Nelson W. Bowman, formerly New York district sales manager, General Refractories Co., has been transferred to the main office in Philadelphia. **Edward E. Christopher** has been named head of the New York office and **Thomas F. Fallon** has succeeded him as district sales manager in St. Louis. **David R. Sieber** has been named consultant in the Pittsburgh office and **Ward M. Troutman** has succeeded him as district sales manager there. **Fred W. Schwartz** has been named assistant district sales manager, Pittsburgh, and **Paul M. Johnson** has joined the Cleveland office. The latter was formerly with Youngstown Sheet & Tube Co., Youngstown, O.

♦ ♦ ♦

Charles A. Schneider has been appointed acting manager of the Baltimore branch, National Lead Co., New York, succeeding **Henry A. Getz,** who has become manager of the metal division of the company's Cleveland branch, which includes the Pittsburgh and Buffalo territories. With the company 37 years, Mr. Schneider has been superintendent of the Baltimore plant since 1940. Mr. Getz, who joined National Lead in 1923, served with Canadian subsidiaries of the company until 1948 when he went to Baltimore. **Russell C. Kleinecke** has been appointed assistant to Mr. Getz in Cleveland.

♦ ♦ ♦

Robert J. Burns has been appointed St. Louis district manager for Industrial Products Division, Goodyear Tire & Rubber Co., Akron, O., succeeding **C. O. Roome** who has retired because of ill health. Other transfers of division representatives include the following: **B. E. McClelland** has replaced Mr. Burns in Chicago; **K. E. Reed** succeeds Mr. McClelland in Madisonville, Ky.; **P. P. Percich** has Mr. Reed's former territory in Jacksonville, Fla.; and **H. V. Atkinson** has replaced Mr. Percich in Chattanooga, Tenn.

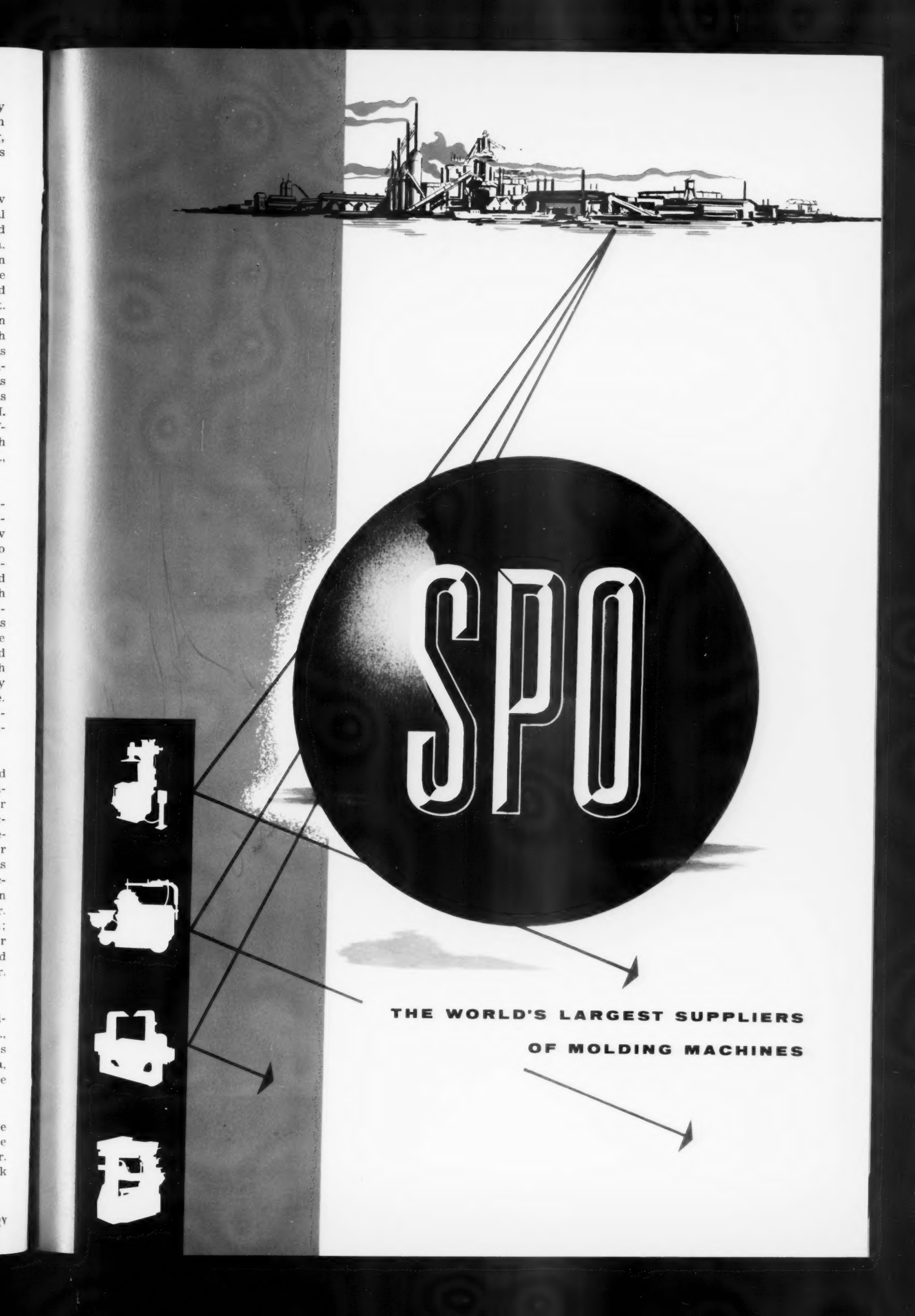
♦ ♦ ♦

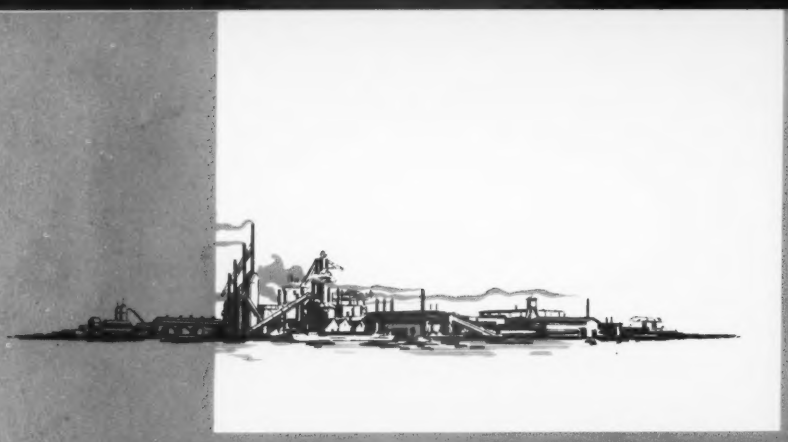
Frank E. Smith, formerly associated with Vesuvius Crucible Co., Pittsburgh, has been appointed sales representative in the East Coast area, Exothermic Alloys Sales & Service Inc., Bridgeville, Pa.

♦ ♦ ♦

A. D. Arnaut and **M. R. Price** have been appointed sales engineers by the Wall Colmonoy Corp., Detroit. Mr. Arnaut, who joins the New York

(*Continued on page* 215)


SPO
THE WORLD'S LARGEST SUPPLIERS
OF MOLDING MACHINES



SPO produces a complete line of molding machines designed to meet the requirements of every foundry. They range from small manually operated units for jobbing operations to huge push-button machines for automatic mass-production.

Every SPO machine is engineered for fast, economical production of uniform standard molds. High quality materials and precision manufacture assure safe easy operation, maximum accuracy and long service life with minimum maintenance. All components are produced to close tolerances to facilitate rapid replacement with no loss of operating efficiency or accuracy.

Most SPO molding machines feature the patented "inverted jolt" mechanism which assures maximum efficiency and long trouble-free service. All machines are shipped complete with necessary valves, controls and lubrication fittings. Only an air line need be attached for operation. Various accessories can be supplied to meet individual needs.

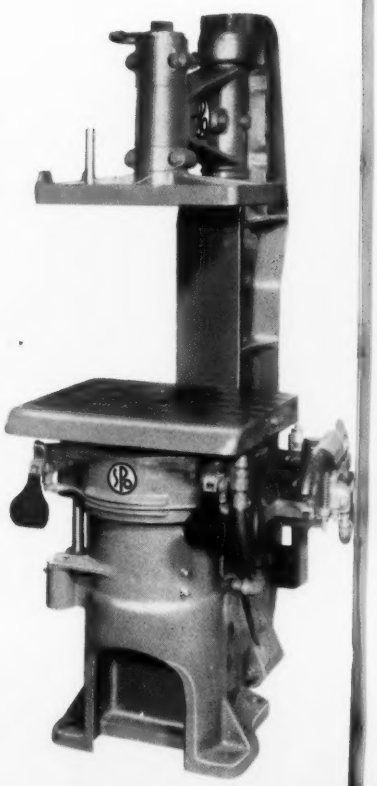
Accuracy, dependability and economy of operation of every unit in its complete line have made SPO the world's largest supplier of molding machines.

Model 110-J

Model 110-J jolt-squeeze molding machine with cantilever type squeeze head has a 10-inch squeeze piston diameter. This type machine is available also with a 13-inch squeeze piston. Both portable and stationary models can be supplied.

Model 110-P

This post type jolt-squeezer can be furnished with 10, 13 and 14-inch squeeze cylinders.



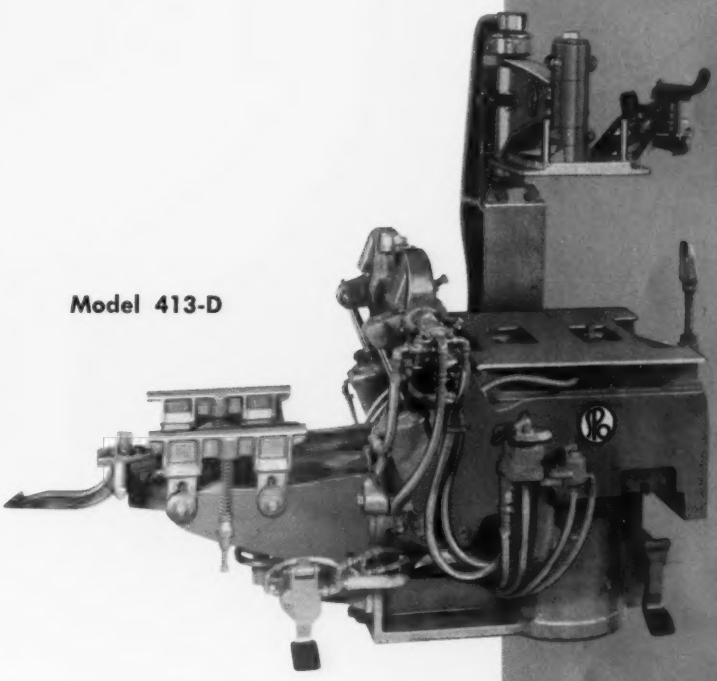
FROM THE SMALLEST TO THE LARGEST . . . A

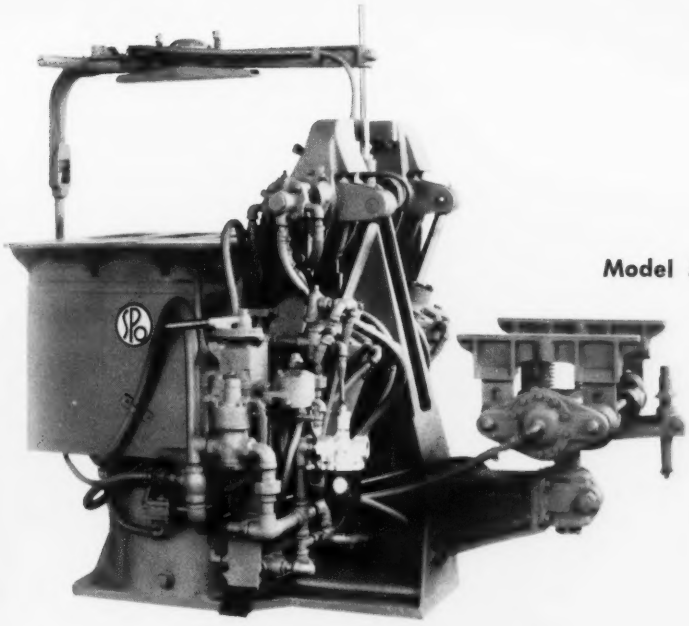
Model 3070

Series 3000 line of SPO jolt pin lifters is designed for diversified production operations. Jolt capacities range from 750 to 4000 pounds on 80 p.s.i. line pressure.

Model No. 413-D jolt-squeeze - rockover - pattern draw molding machine is designed for high production of drag molds. It has 600-pound jolt and 10,000-pound squeeze capacity.

Model 413-D

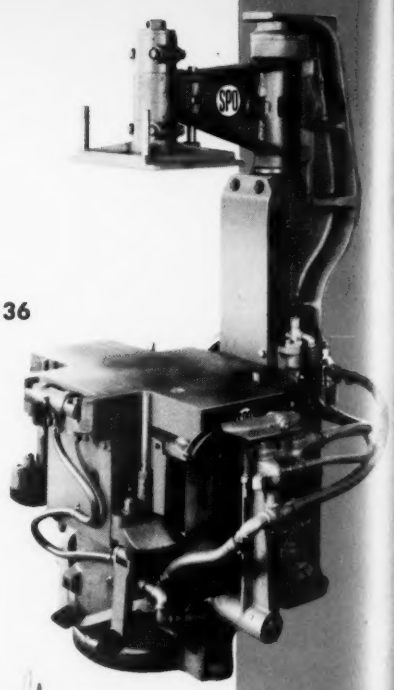




Model 5050

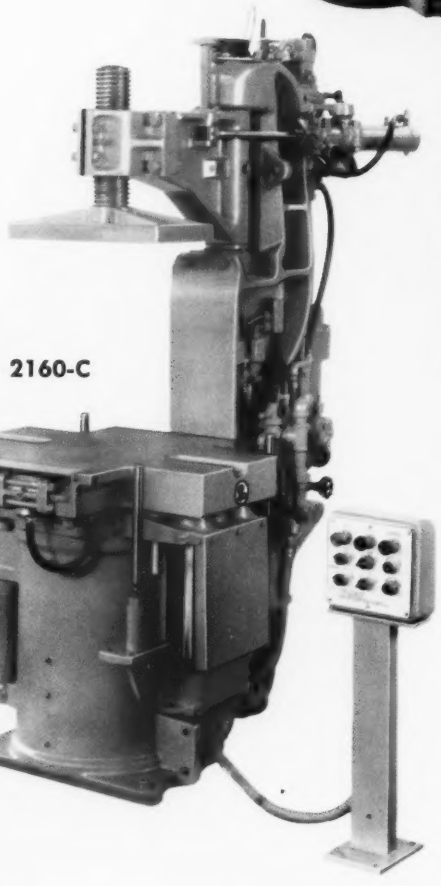
The Series 500 jolt-rock-over-pattern draw machines for the production of drags or cores have jolt capacities ranging from 200 to 1500 pounds on 80 p.s.i. line pressure.

A SPO MACHINE FOR EVERY MOLDING JOB



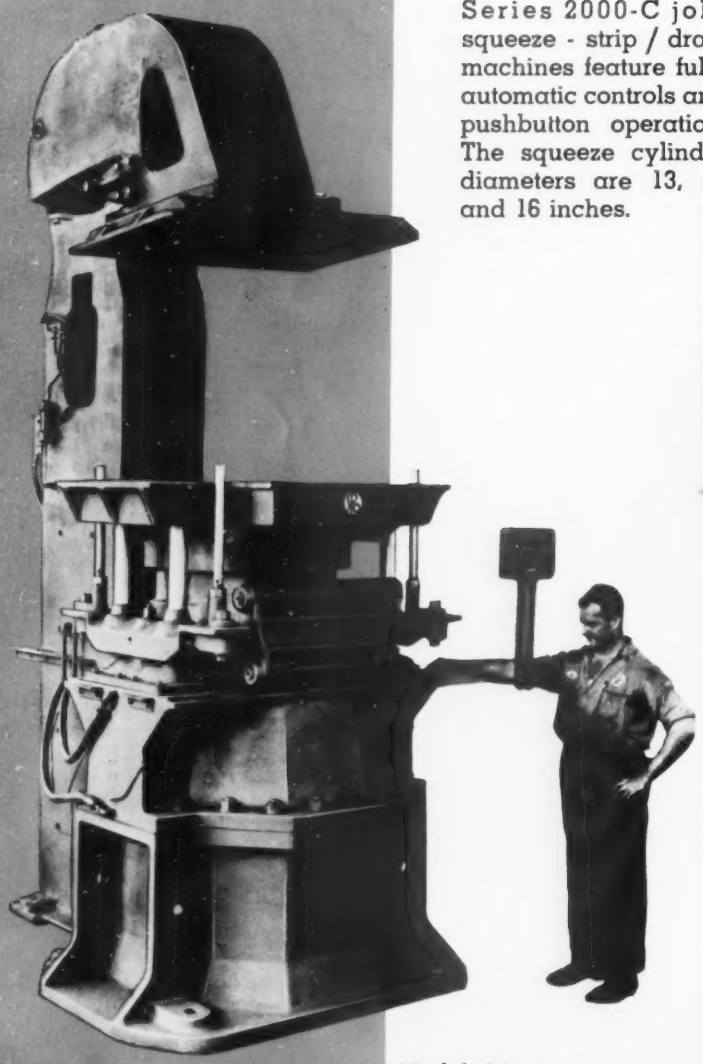
Model 2136

Series 2000 jolt-squeeze-strip machines permit high-speed production of uniform standard molds with minimum effort. They are available with squeeze piston diameters of 11, 13, 14 and 16 inches.



Series 2000-C jolt-squeeze - strip / draw machines feature fully automatic controls and pushbutton operation. The squeeze cylinder diameters are 13, 14 and 16 inches.

Model 2160-C



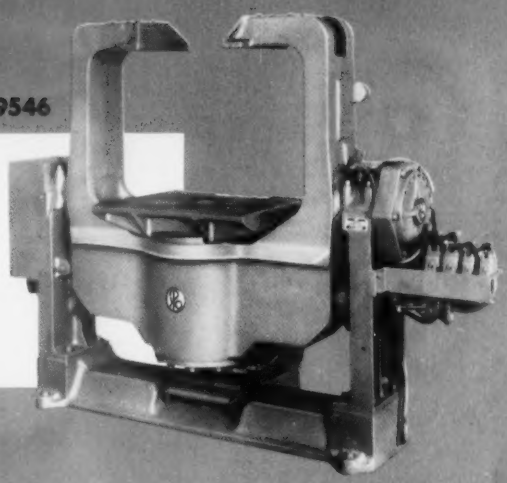
World's largest jolt-squeeze-strip molding machine, Model No. 2364 has a 36-inch squeeze piston diameter. It features automatic control by pushbutton-actuated solenoid valves. This type of machine can be supplied also with 19 and 22-inch diameter pistons.

Model 2364

FROM THE SMALLEST TO THE LARGEST . . . A

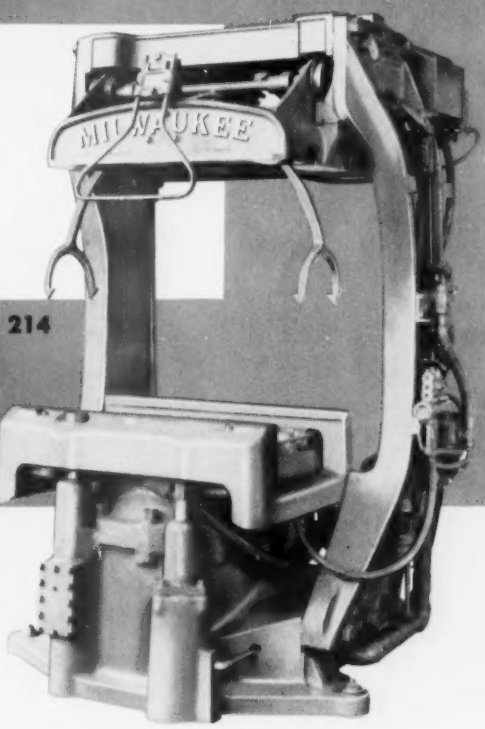
Model 9546

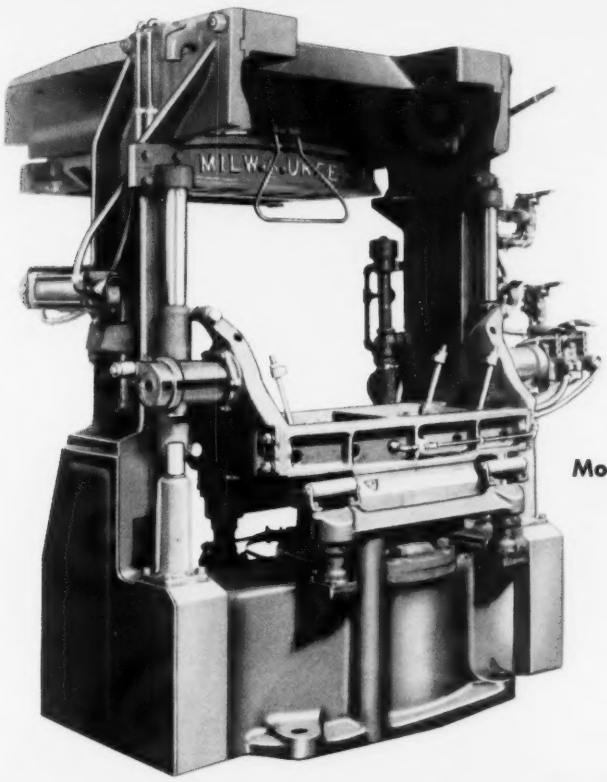
Engineered for fast, low-cost production of drag molds, the 9000 Series jolt-squeeze-clamp-rollover-draw machines have squeeze capacities of 11,000 and 15,000 pounds.



Model No. 214, smallest in a line of car type jolt-squeeze-strippers, has a 21-inch squeeze piston diameter. Overhead mold removal device efficiently handles large flasks at fast speeds. Other models in the line have 24 and 30-inch squeeze pistons.

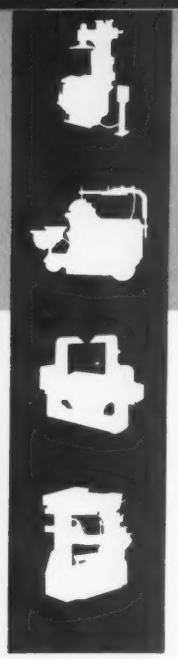
Model 214



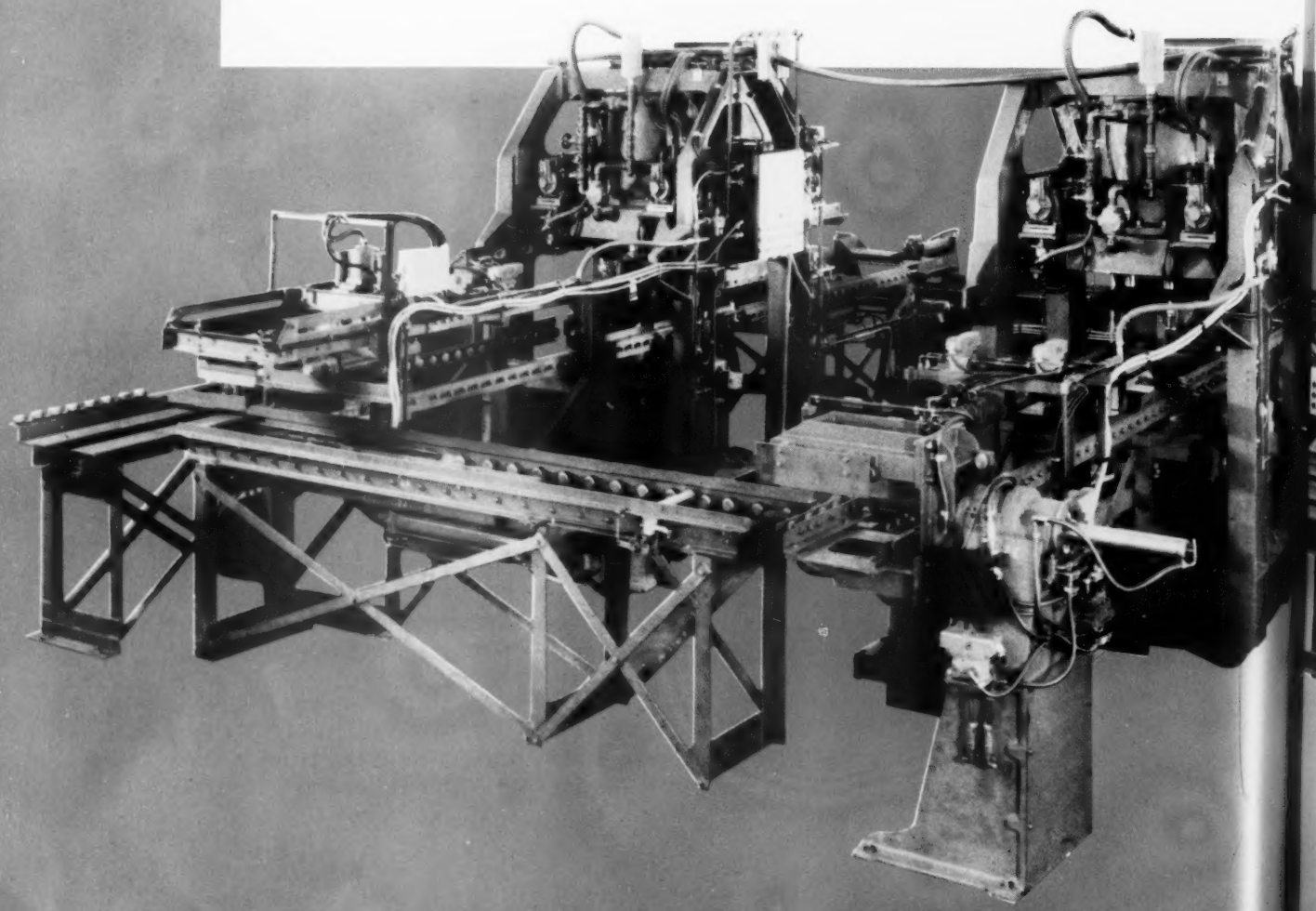


Model 217

Model No. 217 jolt-squeeze-rollover-draw machine combines all operations in the simplest possible operating cycle for fast production of drag molds. It has a squeeze piston diameter of 21 inches. Two other models with 16 and 30-inch squeeze pistons also can be supplied.

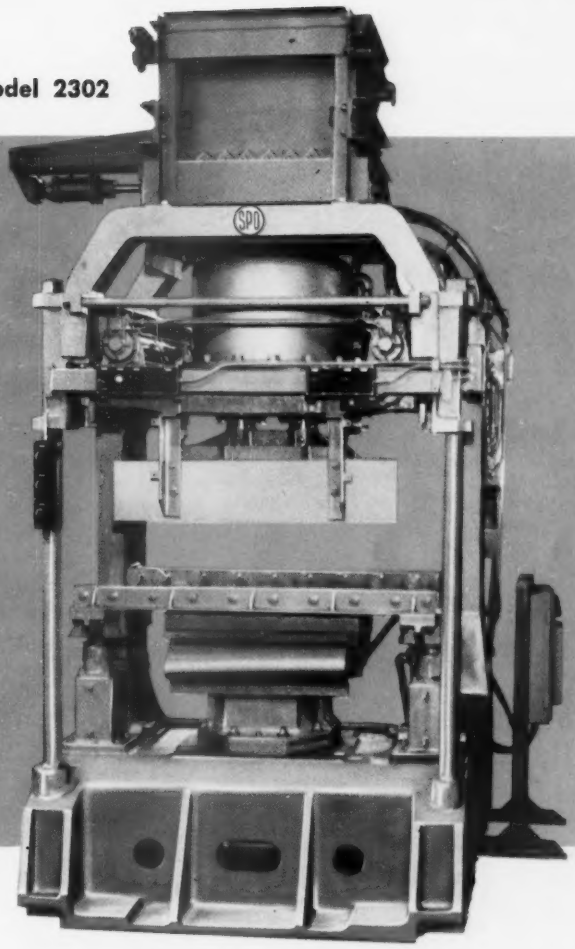


To meet the problem of achieving greater economy and efficiency in the face of rising costs, many foundries today are turning to automation . . . the use of fully automatic machinery and systems which can operate with minimum supervision and human effort. The new SPOMATIC, the first practical automatic molding unit, makes possible complete automation in the foundry. It provides the most efficient, economical and high-speed method of "hands-off" production molding available today. Once a SPOMATIC is started, all operations are fully automatic, mechanical and continuous. For foundries whose plant conditions or production volume do not permit the use of full automation, a newly developed line of semi-automatic roll-on roll-off jolt squeeze strip machines provide the answer to more efficient, economical production.



FROM THE SMALLEST TO THE LARGEST . . . A

Model 2302



Designed to fit into existing foundry facilities, the new SPO line of semi-automatic jolt squeeze strip roll-on roll-off molding machines is engineered for high-speed production of accurate molds. These versatile machines can be used either as separate units or in conjunction with SPOMATIC-type devices for automatic mold closing and flask transfer, knockout and separation.

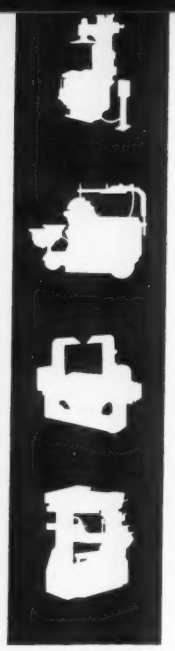
This line of high-production units features overhead squeeze cylinder, sand metering device, inverted jolt mechanism and simplified electrical controls. All machines are designed for ready accessibility for service or repairs.

Series MM Spomatic

The Series MM SPOMATIC automatic molding unit makes accurate copes and drags simultaneously. It sets the cores, closes the molds, and puts them on the pouring conveyor. After the molds have been poured and put through a cooling cycle, the SPOMATIC knocks out, cleans and separates the flasks and feeds them back into their respective ramming machines for immediate re-use.

The complete operating cycle of the SPOMATIC is set up quickly and easily. After the controls are set, it is ready for continuous automatic production molding. The master control panel utilizes only two buttons ("ON" and "STOP") and three selector switches for automatic or manual operation.

Because SPOMATIC installations are engineered to individual requirements, capacities of the various integral units can be widely varied. Each machine's versatility is controlled by the flask size specified and the variety of molds possible within that size.

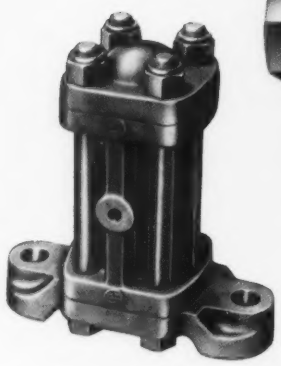


SPO produces a complete line of air vibrators for a wide range of applications requiring powerful, dependable vibration. They are carefully designed and built of high quality materials to withstand continual hard usage and still perform at peak efficiency.

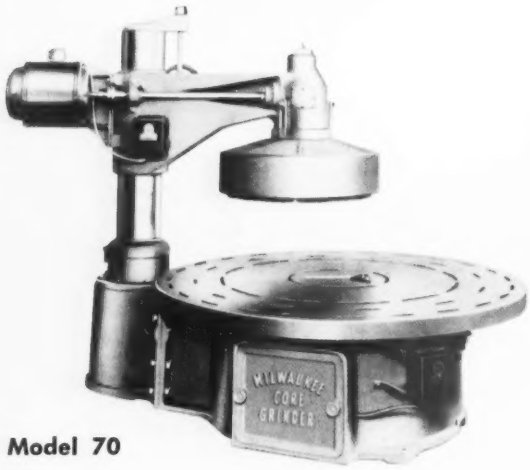
All SPO air vibrators incorporate a special corrosionproof bronze alloy cylinder liner that assures full-power starting, thorough lubrication, high-speed operation, low air consumption and long service life.

Series 76

Series 78



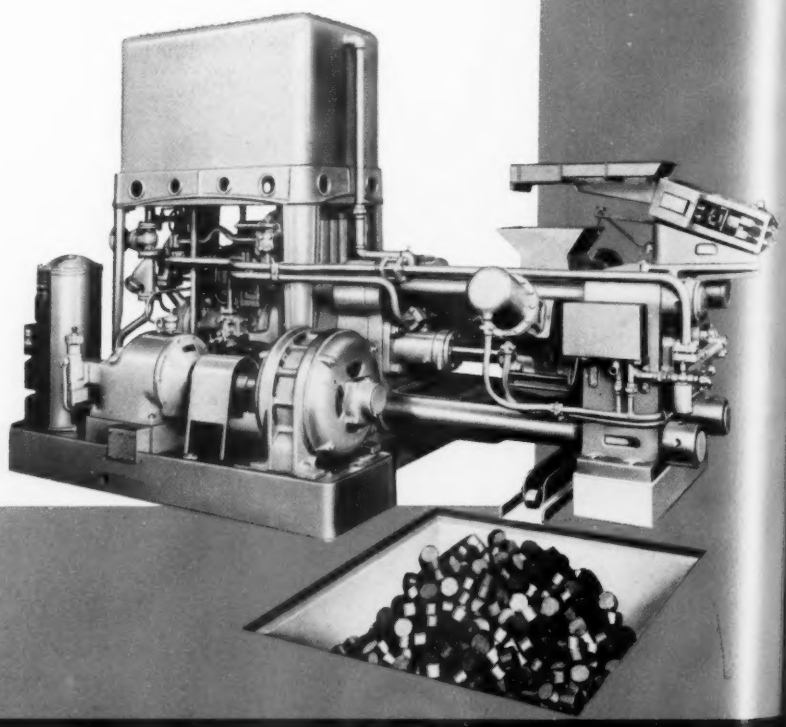
Series 81



Model 70

SPO-MILWAUKEE type core grinders are engineered for fast, vibrationless performance on a wide variety of jobs. They can be adjusted easily to accommodate practically all types of intricate and cumbersome cores. Available in both stationary and portable models, these units grind a uniformly flat face without broken edges in a fraction of the time required for manual filing or scraping of cores.

MILWAUKEE briquetting presses can convert up to 3½ tons of bulk machine tool scrap per hour into dense cylindrical briquettes. Classified as high-grade scrap, these briquettes can be charged directly into a furnace or foundry cupola. They also greatly simplify scrap handling and storage problems. Six models of the MILWAUKEE briquetting press are available to meet a wide range of converting requirements.



Model 350

WORLD'S LARGEST SUPPLIERS OF MOLDING MACHINES

SPO

SPO INCORPORATED

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7000 GRAND DIVISION AVENUE • CLEVELAND 25, OHIO

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LEONARD R. HETKE
. . . FOUNDRY district mgr.

NICK POPA
. . . special equipment sales

KENNETH W. JONES
. . . eastern sales, Stevens

ALBERT J. WELCH
. . . sales representative

(*Continued from page* 206)
sales force at Linden, N. J., formerly was assistant sales manager in New York for the Denver Equipment Co. Mr. Price, new sales engineer in Pittsburgh, had been an engineer with Jones & Laughlin Steel Corp.

♦ ♦ ♦

Leonard R. Hetke has been appointed district manager of FOUNDRY in the Chicago area, succeeding **Robert Chew,** who has been transferred to *Machine Design,* another Penton publication. Mr. Hetke will be associated with A. W. Johansen, regional manager of the Chicago office. A native of Cleveland, Mr. Hetke was graduated from Bowling Green State University, and for the past year was in catalog sales work with Gillette Publishing Co., Chicago, following two years with Fred R. Jones & Associates, publishers' representative, Chicago.

♦ ♦ ♦

O. S. Stewart, formerly president, Cleveland Metal Abrasive Co., Cleveland, has been elected chairman of the board of directors. Mr. Stewart has headed the company since its establishment in 1937. **Raymond J. Stewart,** who has been associated with the company since its beginning, has succeeded his father as president. Between 1942 and 1945 he served in the U. S. Army, and until recently was vice president of the company. J. M. McKenzie and J. J. Raleigh have been re-elected vice presidents.

♦ ♦ ♦

Eugene J. LaPorte has been appointed assistant to the sales division manager in Chicago, Cleco Division, Reed Roller Bit Co., Houston, Tex. He joined the company in 1951. **J. T. Roberts,** senior salesman in the Kansas City, Mo., area, has been transferred to Chicago to replace Mr. LaPorte as salesman there.

Kenneth W. Jones has been appointed sales representative in Connecticut and northeastern New York for the Foundry Sales Division, Frederic B. Stevens Inc., Detroit. A graduate of University of Connecticut, Mr. Jones was formerly associated with Fafnir Ball Bearing Co., New Britain, Conn. **Albert J. Welch,** for the past 8 years assistant production manager, Cascade Foundry Co., Erie, Pa., has been appointed division sales representative in southwestern Pennsylvania. **Nick Popa** has been named special equipment sales engineer for the Foundry Sales Division to handle sales of foundry equipment made by Sutter Products Co., Dearborn, Mich., and distributed exclusively by the Stevens organization. For 7 years Mr. Popa has been design engineer associated with the Sutter organization.

♦ ♦ ♦

Elton W. Turner and **Bruce H. Lowe** have been appointed Detroit office sales engineers, Hydraulic Press Mfg. Co., Mount Gilead, O. Mr. Turner has been associated with Ingersoll-Rand Co., New York, and Mr. Lowe with Farm Supply Co., Detroit. **Harry R. Chase,** previously with U. S. Gypsum Co., Oakfield, N. Y., and **Raymond L. Moreland,** with Champion Dish Washing Machine Co., Erie, Pa., have been named sales engineers in the company's Pittsburgh office.

♦ ♦ ♦

J. A. Cuneo, since 1951 general sales manager, Fairbanks, Morse & Co., Chicago, has been elected vice president-sales. Mr. Cuneo, who joined the company in 1929, was previously in the export division and Los Angeles branch manager. **Robert B. Craig,** in the Washington office, was also elected a vice president. **O. S. Leslie,** vice president-manufacturing, was named a director.

♦ ♦ ♦

Richard E. Farrell has been appointed sales representative in the Philadelphia district, Vesuvius Crucible Co., Pittsburgh.

♦ ♦ ♦

L. W. Jordan has been appointed vice president for the Pacific region of the Linde Air Products Co., division of Union Carbide & Carbon Corp.

O. S. STEWART
. . . becomes board chairman

RAY J. STEWART
. . . Cleveland Abrasive pres.

Mr. Jordan joined the company in 1925 and became San Francisco district manager in 1930. In 1932 he was made Los Angeles district manager and three years later was appointed manager of the Pacific Coast region.

♦ ♦ ♦

Joseph Sully has been named president, Sherratt Brass Foundry Ltd., successor to W. Sherratt & Son, Toronto, Ont. Mr. Sully, formerly president, Sully Brass Foundry Ltd., Toronto, founded by his father in 1921, retired four years ago when the company was absorbed by Neptune Meters Ltd., an affiliate. He is a former chairman of the Ontario Chapter of the American Foundrymen's Society, and a former director of the national organization.

♦ ♦ ♦

Lewis J. Gambow recently joined Republic Mfg. Co., Cleveland, maker of hydraulic valves. Mr. Gambow attended John Carroll University, Cleveland College and Fenn College and for 11 years was associated with Standard Products Co., Cleveland. In 1951 he joined Pioneer Alloy Products Co., there, and since 1952, when it became a division of National Lead Co., New York, was sales manager of the division in Ellwood City, Pa.

♦ ♦ ♦

Edward L. Clark has been appointed representative in the Cleveland area, and **Robert Speidel** representative in the Detroit area, to handle sales of head and eye protective equipment for Pennsylvania Optical Co., Reading, Pa.

♦ ♦ ♦

Robert A. Rohn, assistant manager of Aluminum Co. of America's Cleveland sales office, has been transferred to the San Francisco office in the newly created position of assistant manager. Mr. Rohn, a chemical engineering graduate of the University of Wisconsin, has been with the company since his graduation in 1930.

♦ ♦ ♦

Richard McLean has been appointed foundry superintendent, City Pattern Foundry & Machine Co., Detroit. **Frank Heffner** has been made purchasing agent and **Joseph C. Nuttall** is in charge of shipping.

JOSEPH SULLY
. . . heads brass foundry

JAMES R. COLEY
. . . secretary-sales mgr., Ajax

WILLIAM T. THOMAS
. . . joins Ajax Electrothermic

ASHLEY B. SINNETT
. . . AFS educational director

James R. Coley was recently named secretary-sales manager, Ajax Electrothermic Corp., Trenton, N. J., succeeding the late George F. Applegate. Mr. Coley has been with the company since 1928 in engineering and sales positions. **William T. Thomas,** formerly associated with General Electric Co., Syracuse, N. Y., has joined Ajax Electrothermic as assistant chief engineer. During 15 years with General Electric Co., Mr. Thomas worked in co-operation with Ajax to develop equipment for the Ajax line of induction furnaces.

♦ ♦ ♦

H. A. Barber has been named president, Barber-Greene Co., Aurora, Ill., succeeding **W. B. Greene** who has been named chairman of the board. Mr. Greene founded the company in 1916 with Harry H. Barber, father of the new president. The following have been elected vice presidents: **S. E. Faircloth,** production; **E. H. Holt,** sales; **J. D. Turner,** publicity; **E. E. Herting,** comptroller; and **R. C. Heacock,** manufacturing-engineering. **J. M. Spence** has been made treasurer, **W. A. Greene** secretary.

♦ ♦ ♦

J. G. Uzelac recently was appointed manager of the new Salt Lake City, Utah, sales office of the Denver Equipment Co., Denver. Mr. Uzelac, a native of Utah, has managed the company's Chicago office for the past several years. **Keith Wick,** former sales engineer in the company's Denver office, will take over the Chicago territory.

♦ ♦ ♦

Ashley B. Sinnett has been appointed educational director of the American Foundrymen's Society, with headquarters in Chicago. Mr. Sinnett was graduated from Michigan State College in 1952 and will complete his master's work there this summer. Since graduation he has served on the staff of the mechanical engineering school at Michigan State, teaching foundry, patternmaking and manufacturing processes.

♦ ♦ ♦

J. B. McNaughton, for 8 years manager of industrial engineering, Jeffrey Mfg. Co., Columbus, O., was recently named manager of its new special products division where he will direct the contract work program for companies requiring additional metalworking facilities. New division will offer metal-working facilities for foundry work, patternmaking, grinding, cutting, etc.

♦ ♦ ♦

Thomas R. Nugent has been appointed sales representative, Tamms Industries Inc., Chicago, to handle the company's line of foundry products in Florida.

♦ ♦ ♦

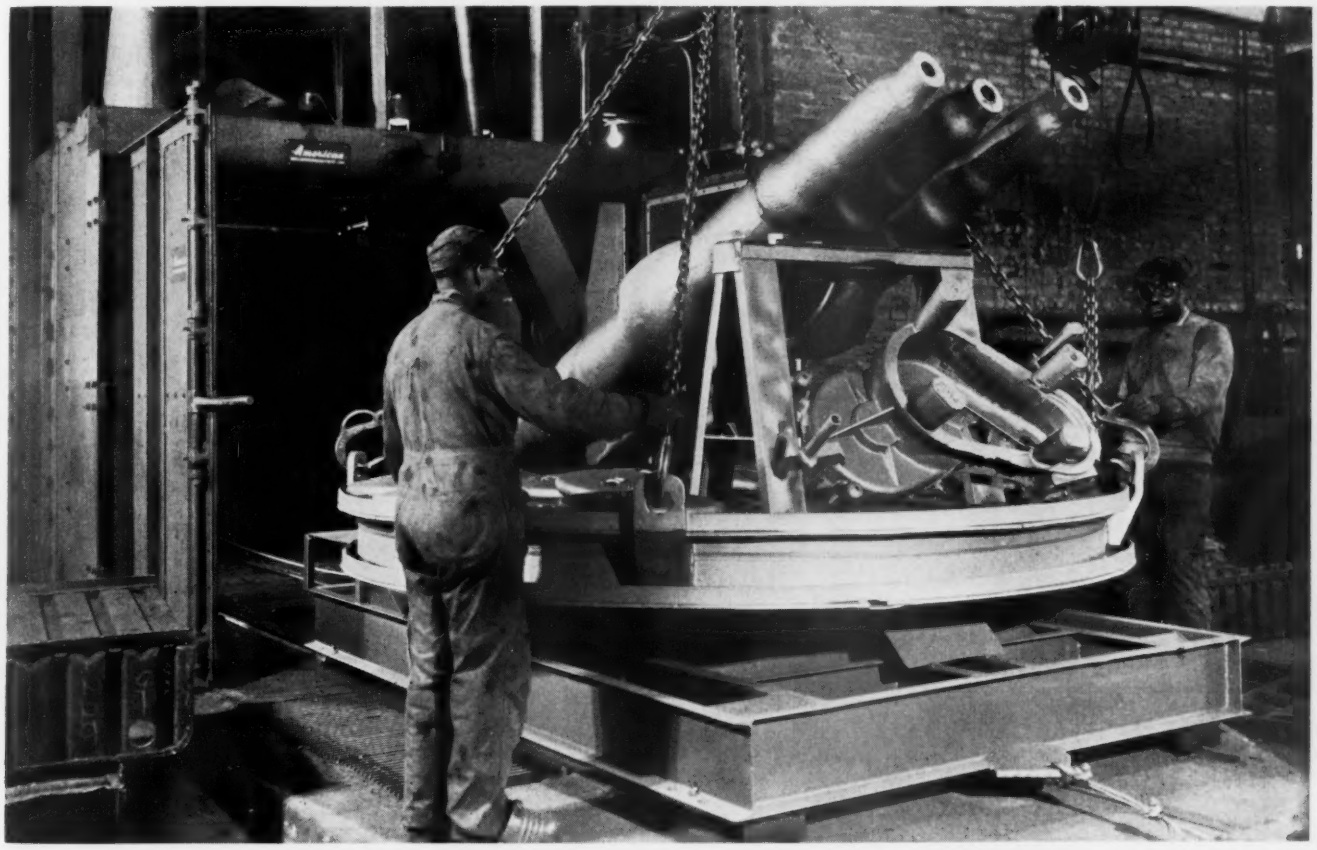
Julien R. Steelman, president, Koehring Co., Milwaukee, was recently elected president of the Power Crane and Shovel Association, New York.

♦ ♦ ♦

J. M. Ilacqua has been appointed field engineer, Lamson Corp., Syracuse, N. Y., to handle sale of airtubes, conveyors and blowers for the com-

(*Continued on page* 219)

pioneering developments keep **WHEELABRATOR**® *first in blast cleaning*



cleaning steel castings weighing up to 8000 lbs. in 12 minutes

Wheelabrator Car-Type Room Slashes Airblast Cleaning Time 40%

If you are still depending upon costly, unhygienic airblasting for cleaning large, bulky castings, you can profit by the experience of a prominent Chicago steel foundry. They recently replaced a large airblast room with an airless Wheelabrator Car-Type Room with these profitable results:

(1) Immediate reduction of 28 manhours daily in direct cleaning room labor.

(2) Castings weighing up to 8000 lbs. are cleaned in just 12 minutes—a small fraction of former time.

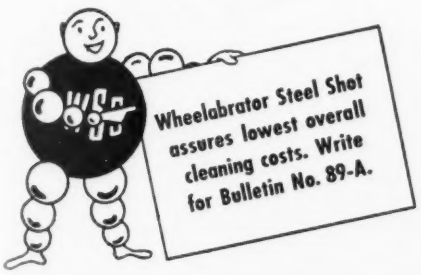
(3) Chipping and grinding costs drastically reduced due to the improved surface cleanliness of the work.

(4) Working conditions greatly improved.

(5) Cleans many castings not economically feasible by airblasting.

You, too, can transform your slow and costly airblasting into a high production hygienic, low cost operation with a Wheelabrator Room. *American* engineers, long experienced in designing machines for special applications, have developed many different sizes and types of such units to meet practically any cleaning requirement.

Let us tell you how you can profit with a Wheelabrator Room for your difficult cleaning problem. Write today for a copy of Bulletin 854 which describes numerous machine designs and includes many actual job-study reports.



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WHEELABRATOR & EQUIPMENT CORP.
AIRLESS BLAST CLEANING

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Manufacturers and Selling Agents: CONTINENTAL EUROPE—George Fischer, Ltd., Schaffhausen, Switzerland; BRITISH COMMONWEALTH—Tilghman's Patent Sand Blast Co. Ltd., Broadheath, England; JAPAN—Tokyo Boeki Kaisha, Tokyo; BRAZIL and ARGENTINA—Equipamentos Industriais EISA Ltda., Sao Paulo. Brazil; AUSTRALIA—McPherson's, Melbourne; MEXICO—Casco, S. De R. L., Mexico, D.F.

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Spot grinding! Smoothing welds! Grinding in corners! Working with odd shapes! Wherever low-cost, top-operating efficiency is essential, Simonds portable wheels fill the bill. They cut fast, hold their shapes, give long service, and include everything you need—straight wheels, cup wheels, cones, pot-balls and blind-end wheels. Resinoid bonded for high speeds up to 9500 s.f.p.m. Write for free folder ESA-62.

Rotor type cup wheel—cross section shows steel bushing flange and safety ring.

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ARTHUR A. CONRAD
. . . Inco research division

OSCAR H. KRAFT
. . . foundry equipment sales

HAROLD G. LOLLEY
. . . joins Thiem Products

NATHANIEL E. DUVAL
. . . Michiana Products pres.

(*Continued from page* 216)
pany's commercial division in upper New York, east of Rochester. **Albro E. Hall,** formerly in the Syracuse, N. Y., territory, has replaced Mr. Ilacqua in western New York.

♦ ♦ ♦

Arthur A. Conrad Jr., formerly chief metallurgist, Precision Metalsmiths Inc., Cleveland, recently joined the Detroit technical section of the Development and Research Division, International Nickel Co., New York. Mr. Conrad was graduated from Carnegie Institute of Technology and was previously engaged in metallurgical work with Carnegie-Illinois Steel Corp., Pittsburgh, National Tube Co., Lorain, O., and at U. S. Steel Corp.'s research laboratory, Kearny, N. J.

♦ ♦ ♦

Arthur S. Klopf, until recently West coast sales manager, Missouri Coke & Chemical Division, Great Lakes Carbon Corp., New York, has been appointed general sales manager with offices at the St. Louis headquarters of the division. A graduate of Marquette University, Mr. Klopf received a master's degree in metallurgical engineering from University of Wisconsin. He was formerly vice president, Western Foundry Co., Chicago.

♦ ♦ ♦

Oscar H. Kraft has been appointed sales manager, Foundry Equipment Division, Westover Engineers, Milwaukee. Until recently Mr. Kraft was associated with Bucyrus-Erie Co., in South Milwaukee, where he held positions as foundry superintendent and works manager.

♦ ♦ ♦

Donald E. Thal has been appointed central general manager, Pacific Division, Link-Belt Co., Chicago, responsible for general management of the San Francisco plant and for sales in the division's central area. Mr. Thal attended University of Illinois and Massachusetts Institute of Technology and joined Link-Belt in 1936. He served in the Chicago and Seattle plants and recently as sales manager of the San Francisco plant.

Nathaniel E. Duval was elected president, Michiana Products Corp., Michigan City, Ind., succeeding **Otto M. Carry** who has retired following 25 years as the company's head. Mr. Duval was graduated from University of Pennsylvania and Lowell Technological Institute. He was formerly vice president, Massachusetts Mohair Plush Co., Lowell, Mass., and has been a director of Michiana Products Corp. for 3 years.

♦ ♦ ♦

Harold G. Lolley has joined Thiem Products Inc., Milwaukee, as sales service engineer. For the past 3 years Mr. Lolley was foundry superintendent, Rosedale Foundry & Machine Co., Pittsburgh. Prior to that he was foundry superintendent, Bucyrus-Erie Corp., Erie, Pa. Mr. Lolley is a former director of the Northwestern Pennsylvania Chapter of the American Foundrymen's Society.

♦ ♦ ♦

William N. Jove has retired as field engineer in the Chicago area, Norton
(*Concluded on page* 222)

ARTHUR S. KLOPF
. . . division sales mgr.

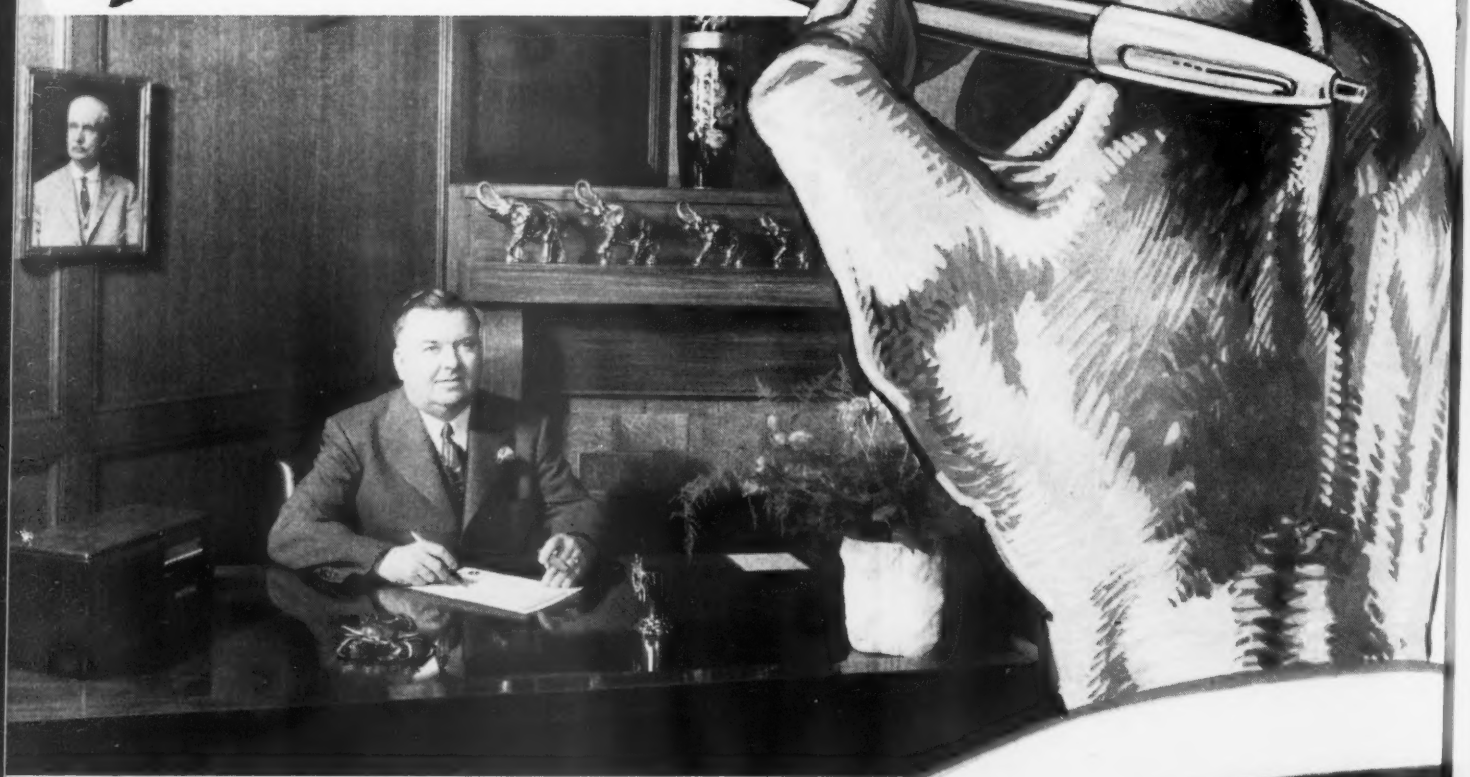
DONALD E. THAL
. . . Link-Belt, San Francisco

WILLIAM N. JOVE
. . . leaves Norton Co.

WILLIAM D. BENNETT
. . . retires from Norton

If the Foundry Show i

Seiff-Cornell EXTENDS A



Famous **CORNELL CUPOLA FLUX**

backed by over thirty six years' success in casting improvement, and hundreds of enthusiastic customers.

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...is on your agenda...

A PERSONAL INVITATION

. . . to visit us at

BOOTH 125 CLEVELAND PUBLIC AUDITORIUM

and attend our after session social gathering and entertainment in our Suite at

HOTEL AUDITORIUM

(Across street from Foundry Show.)

JOIN MANY LEADING FOUNDRYMEN WHO HAVE MINIMIZED CASTING REJECTS BY USING

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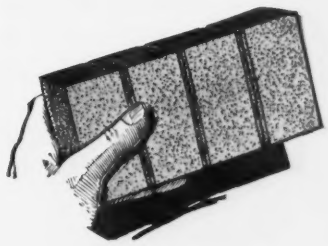

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SCORED BRICK FORM

•

Malleable foundries with cupolas find it invaluable, too.

•

Write for Bulletin No. 46-B.

The Cleveland Flux Co.

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Manufacturers of Iron, Semi-Steel, Malleable, Brass, Bronze, Aluminum and Ladle Fluxes – Since 1918

FAMOUS CORNELL FLUXES

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BRASS FLUX

FAMOUS CORNELL BRASS FLUX cleanses molten brass even when the dirtiest brass turnings or sweepings are used. You pour clean, strong castings which withstand high pressure tests and take a beautiful finish. The use of this flux saves considerable tin and other metals, and keeps crucible and furnace linings cleaner, adds to lining life and reduces maintenance.

ALUMINUM FLUX

FAMOUS CORNELL ALUMINUM FLUX cleanses molten aluminum so that you pour clean, tough castings. No spongy or porous spots even when more scrap is used. Thinner yet stronger sections can be poured. Castings take a higher polish. Exclusive formula reduces obnoxious gases, improves working conditions.

MEN OF INDUSTRY

(*Concluded from page 219*)

Co., Worcester, Mass., after over 51 years of service with the company in that area. **William D. Bennett,** since 1931 an abrasive engineer in the Cleveland area, has retired following 46 years of service. **Harlan W. Cobb,** with Norton for 37 years, has succeeded Mr. Bennett in Cleveland. **Fred J. Benn** has been appointed an abrasive eengineer to represent the company in the Louisville area. **Sherwood F. Prescott** will cover southern Ohio and eastern Indiana, with headquarters in Cincinnati. **William Reibitz** has been appointed abrasive engineer and **Allan Jaques,** field engineer, in the Detroit district.

♦ ♦ ♦

Howard M. Fitch, general manager, Herman Nelson Division, Moline, Ill., has been elected a vice president of American Air Filter Co., Louisville, the parent company. Mr. Fitch, a graduate of University of Kentucky, joined American Air Filter Co. in 1936, and was sales engineer, production manager, manager of the legal and patent department, and assistant to the executive vice president, until last year when he became the Nelson Division manager.

♦ ♦ ♦

Dr. William Rostoker has been appointed supervisor of physical metallurgy, Armour Research Foundation, Illinois Institute of Technology, succeeding **Dr. Donald J. McPherson,** who has been named supervisor of nonferrous metallurgy. **Verne Pulsifer** has been made head of the department's metallography laboratory.

♦ ♦ ♦

Sidney J. Tuson has been appointed sales representative in eastern Michigan for the Foundry Sales Division, Frederic B. Stevens Inc., Detroit. For 13 years Mr. Tuson was foundry superintendent, Wilson Foundry & Machine Co., Pontiac, Mich.

♦ ♦ ♦

Al E. Lundquist has been appointed sales representative in the Chicago home office, Tamms Industries Inc., to handle its line of raw materials for the paint, varnish and abrasive industries. He has more than 20 years of experience in this field.

♦ ♦ ♦

James L. Goodwin has been appointed Cleveland district manager, Sterling Abrasives Division, Cleveland Quarries Co., Tiffin, O. Mr. Goodwin has had wide experience in the field of industrial abrasives.

♦ ♦ ♦

Millard D. Shriver, formerly sales manager, has been appointed general sales manager, Panellit Inc., Chicago, manufacturer of automatic control and information systems.

♦ ♦ ♦

Richard N. McCord has been appointed sales representative in the Boston area, Pennsylvania Optical Co., Reading, Pa., with headquarters in Bedford, Mass. **Regis H. Voye,** formerly associated with Dravo Corp., Pittsburgh, has been named sales representative in Buffalo.

♦ ♦ ♦

Fred A. Sheridan, formerly production manager, Lakey Foundry Corp., Muskegon, Mich., has been appointed sales manager, succeeding the late George Kramer. Mr. Sheridan was associated with General Electric Co. in Fort Wayne, Ind., prior to joining the company in 1944.

♦ ♦ ♦

Morris G. McQuiggan has joined the foundry coke sales division, Lasalle Coke Co., Montreal, Quebec. He has been associated with the foundry industry for 18 years, in positions of molder, foreman, foundry superintendent and supply salesman.

♦ ♦ ♦

Ronald C. Martin has been appointed vice president-sales, Wilkerson Corp., Englewood, Colo. Until recently he was Chicago regional sales manager for Sloane Delaware Products.

♦ ♦ ♦

Ralph Johansen has been elected vice president, Republic Coal & Coke Co., Chicago. **Bernie E. Urheim** has been named field sales manager.

♦ ♦ ♦

Louis E. Holm, Grand Haven, Mich., has been appointed western Michigan representative, Peninsular Grinding Wheel Sales Corp., Detroit.

Drop In At Booth 1119

FOUNDRY will have booth No. 1119 in the Upper Lakeside Hall of Cleveland's Public Auditorium during the AFS Foundry Show, May 8 to 14. The business and editorial staffs cordially invite you to drop in and see us. Excellent chairs and a fine view will permit the weary foundryman to rest his tired dogs and enjoy a visit.

Book Review

Ferrous Process Metallurgy, by John L. Bray, cloth, 414 pages, 6 x 9 in., published by John Wiley & Sons Inc., 440 Fourth Ave., New York 16. Price $6.50.

This book was written as a college text for a junior or senior course and is concerned solely with the production of iron from properly prepared and commonly available raw materials, the refining of this iron into steel, and the casting of the steel into an acceptable ingot for further processing and fabrication. In eight chapters are discussed raw materials, iron blast furnaces, wrought iron, bessemer process, basic open hearth process, acid open-hearth process, electric furnaces, ingots and ingot molds. Processes are thoroughly covered and predictions made about future developments.

Much of the historical matter, properties of alloys, industry statistics, pricing systems and minor processes have been omitted as it was the author's premise that these matters could be discussed in class from current data supplied from other sources.

The types of equipment used in the various processes is briefly described.

Non-Ferrous Founders Meet in Cleveland

ANNUAL meetings of the Non-Ferrous Founders' Society will be held in Cleveland, O. May 8-10 so that executives of nonferrous foundries may combine attendance at the society's functions and also take advantage of the technical sessions and show of the American Foundrymen's Society annual convention.

The last meeting of the 1953-54 board of directors will be held on Saturday, May 8, at the Carter Hotel.

On Sunday afternoon, May 9, the annual business meeting for members of the society will also be held at the Carter Hotel. At this meeting, reports on various activities and programs of the society, including group insurance, will be presented.

On Monday evening, May 10, the Annual dinner meeting of the society will be held in the ballroom of the Carter Hotel. Preceding the dinner, which is scheduled for 7 p.m., guests and members are invited to participate in a reception and cocktail hour sponsored by and with the compliments of the Cleveland Chapter. An unusual and entertaining program has been arranged. In addition, there will be a presentation of the president's plaque and newly elected officers will be presented.

This dinner meeting is open to all nonferrous foundrymen and their friends.

Here are Complete facilities...

for your CAST AND MACHINED PARTS

City Pattern Foundry & Machine Company offers unparalleled facilities for the complete production of cast and machined parts. Working directly from your part print, we make the pattern, cast the parts and then precision machine them; all operations are performed right under our own roof.

In every phase of the processing the most modern methods and equipment are used. And to safeguard consistent high quality, every known piece of inspection equipment is on hand to chemically, physically and dimensionally measure your parts before shipment.

Thus, complete responsibility for your cast machined parts are in the hands of one competent, completely equipped source. Why not take advantage of the obvious benefits next time *you* are ordering cast and machined parts.

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Since 1913...

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Steel Founders' Society . . .

Holds Annual Meeting

A. J. McDONALD
President

A. M. SLICHTER
Vice President

By FRANK G. STEINEBACH
Editor

MEMBERS of the Steel Founders' Society of America, meeting at the Edgewater Beach Hotel, Chicago, Mar. 16-17, heard reports on the various activities which that organization has sponsored during the past year, and noted highly satisfactory progress.

The meeting considered numerous pressing problems of the steel castings industry and determined that the solution to many of these requires more widespread application of the technical and operating knowledge now available through the society. Greater emphasis on sales and service also was indicated.

Officers for 1954 were recently announced as follows: President, A. J. McDonald, vice president, American Steel Foundries, Washington; vice president, A. M. Slichter, president, Pelton Steel Casting Co., Milwaukee; treasurer, R. G. Parks, treasurer, National Malleable & Steel Castings Co., Cleveland; executive vice president, F. Kermit Donaldson; technical and research director, Charles W. Briggs; director, Product Development Department, James H. Lowe. Mr. McDonald, Mr. Slichter and H. L. McClees, Crucible Steel Casting Co., Lansdowne, Pa., constitute the Executive Committee.

CLARENCE TOLAN JR.
Lorenz Medalist

F. X. HOHN
T. & O. Medalist

A highlight of the successful meeting was the award of the Lorenz Memorial Gold Medal for 1953 to Clarence Tolan Jr., chairman of the board, Dodge Steel Co., Philadelphia, for his many contributions to the progress of the organization. The Technical and Operating Gold Medal Award for 1953 was awarded to F. X. Hohn, assistant works manager and chief metallurgist, Scullin Steel Co., St. Louis, for his many contributions to the technical and research activities of the society.

A. J. McDonald, president of the society, reported splendid progress in committee activities during 1953. He stated that this work would continue during 1954, with some possible change in emphasis and direction. Activities in main have been directed toward the effort to reduce costs in the production of steel castings, and have been based on such factors as safety education, cost of labor including fringe benefits, improvement in quality, product development, greater use of technical information, more aggressive sales effort and better use of statistics.

Mr. McDonald stated that the Advertising and Publicity Committee has supervised the preparation and distribution of 80,000 pieces of literature on steel castings requested by designers, engineers, colleges and customers. The committee developed and had prepared a slide-motion film on castings design which has been well received. The Product Development Committee participated in 85 meetings of society groups, established minimum standards of quality for steel castings which now are being used on a voluntary basis, and prepared a report on the quality of

(*Continued on page* 226)

P. J. NEFF

H. E. EDSALL

F. E. BROWNE

H. L. McCLEES

Winners of cash awards for excellence of their articles published in *Steel Foundry Facts*

"I'll get to BUFFALO ANY WAY

...to get those BETTER BUFFALO PATTERNS"

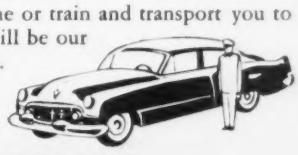
We never really meant to boast,
But foundry men who want the *most,*
Say Buffalo Patterns give you more,
Deliver plusses so galore.

Every job and each detail,
Is Engineered to never fail,
To give you patterns tailor-made,
For value much more than you paid.

Our equipments fit your shop,
And production schedules never drop,
No extra rigging will you do,
And with adapting you are through.

Fine Craftsmanship here you will find,
Scrap ratios hit that cellar line,
So if your foundry likes more dough,
Use these *better* patterns from Buffalo.

Be our guest Just let us know when you are coming to Buffalo on pattern business. One of our cars will meet you at your plane or train and transport you to our club where you will be our guest during your stay.



Production and Experimental Pattern Equipment • Shell Mold Pattern Equipment and Engineering • Wood and Plastic Models • Jigs, Templates and Target Fixtures • Permanent Molds • Forging and Stamping Dies • Dies for Injection and Reinforced Plastics Molding • Special Precision Parts • Special Machinery and Tooling • Metallizing • Engineering Drawing Service

BUFFALO PATTERN WORKS, INC.
832 HERTEL AVE., BUFFALO 16, N. Y.
DESIGNERS AND MANUFACTURERS OF PATTERN EQUIPMENT FOR OVER HALF A CENTURY

these MARTIN products for core box protection

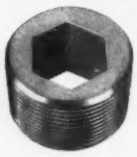
PETERSON VIBROLATOR quietly moves materials from bins and hoppers. Always instant starting. No maintenance, no lubrication. "Vibra-Tak" pocket-size vibration meter available. Check dead spots on vibrated match plates, bins, hoppers.

"SAND ARRESTER TUBE"

Save cores and step up production. Guaranteed for 100,000 blows.

"HOLINER" BUSHINGS

Stop abrasion between blow plate and core box. Protect blow holes.

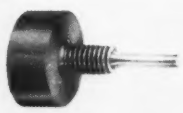


"PROTEXABOX" PINS

Cannot mar the box face because of protective rubber tip. Guaranteed to stay on.

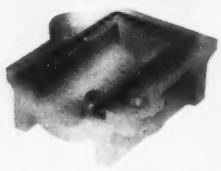
"PULLINSERT" BLOW BUTTONS

Positively stop sand blasting under blow holes. Available in nine popular sizes.



"STRIPINSERT"

Protects parting line — easily installed in old or new boxes. Cutters for groove available at moderate cost.



NON-BINDING FLASK PINS

No production stoppages due to bending or binding of flask pins. Flexes and absorbs abuse, assures easy, perfect match.

See your distributor or write for literature to—

MARTIN ENGINEERING COMPANY

704 FOUNTAIN ST., KEWANEE, ILL.

(*Continued from page* 224)

steel castings which has been discussed by the various society divisions.

The Safety Committee was successful in reducing the frequency rate of the industry from 23.9 in 1952 to 19.2 in 1953. Mr. McDonald stressed the possibilities for further reduction if the industry will follow the leadership provided by the society's safety program. In addition to the district T and O meetings, that committee staged the seventh annual conference in Cleveland in 1953 which was the largest in attendance and the most successful in interest. Research projects are moving forward under the Technical and Research Committee, and that group feels the need for individual companies seeing that the research reports are read and put into use.

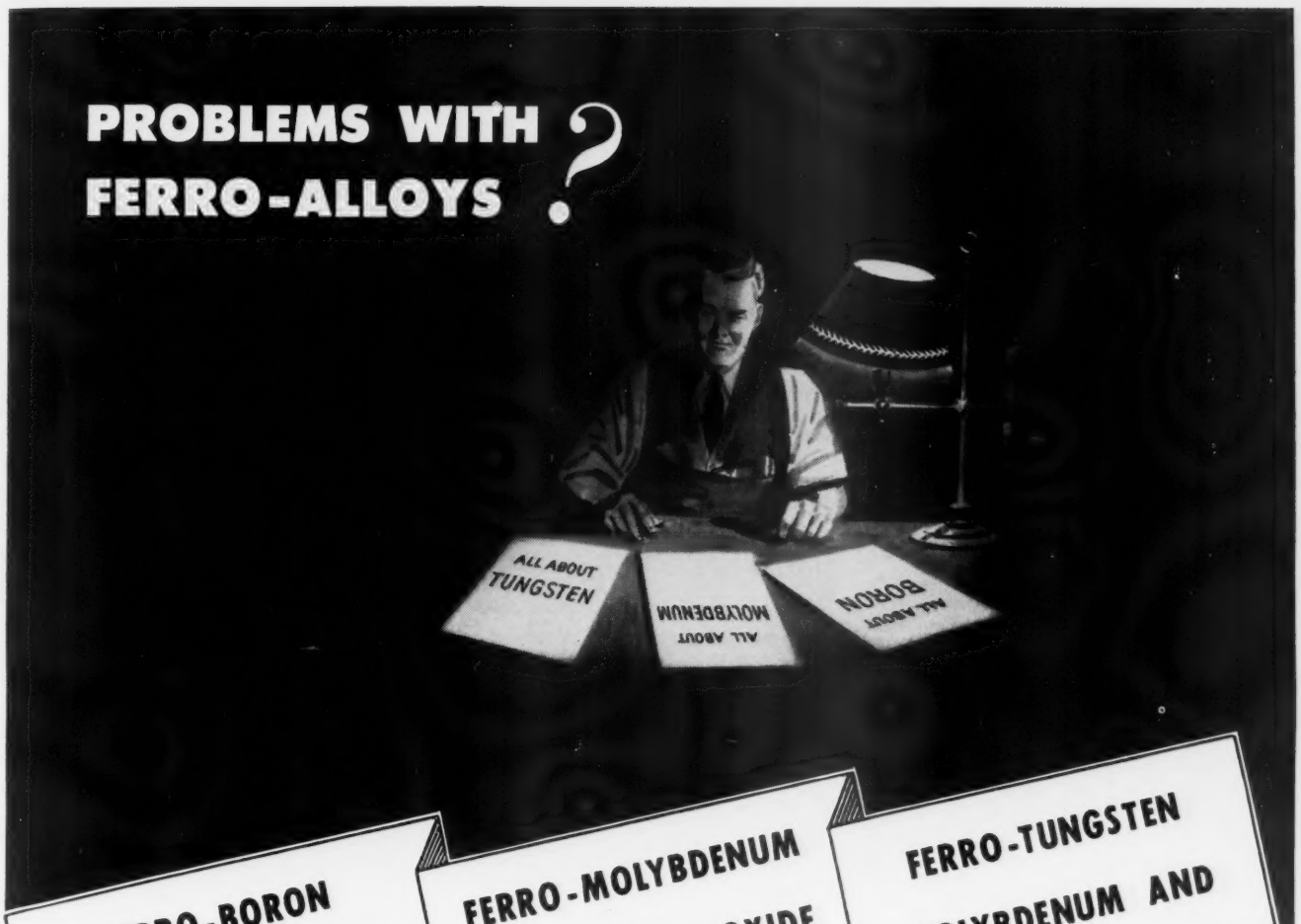
Unexplored Possibilities

Speaking on "The Steel Founders' Customer," L. A. Danse, assistant director, Committee Activities, General Motors Corp., Detroit, stressed the point that steel castings have many possibilities not yet explored. Calling on more potential customers, and providing greater service on a man-to-man basis were recommended as means of enlarging the field of application for cast steel. Mr. Danse also stated that research and development work should be intensified in times when the sales curve turns down. In conclusion, Mr. Danse stated that he hoped to see more steel castings used by both automotive and aircraft producers. Whether or not this develops depends upon the steel castings industry. But he believes that a crystal structure poured into a mold should be better than any form that a blacksmith can pound out.

F. Kermit Donaldson, executive vice president, commented briefly on some of the society activities. He reported that the new film on casting design was shown at the recent Foundry Educational Foundation conference and that the response from the professors was tremendous. Mr. Donaldson told of the work of the society in helping to gain greater recognition in Washington, and stressed the importance of the recently established Castings Branch of the Iron and Steel Division. He stated that the society recently pointed out to the Department of Commerce the importance of not exporting large quantities of iron and steel scrap.

In considering factors related to

(*Continued on page* 228)



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BORON DEOXIDIZERS
BORIDE DEOXIDIZERS

FERRO-MOLYBDENUM
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MOLYBDENUM AND
TUNGSTEN METAL POWDERS

CHEMICALS OF MOLYBDENUM . . . TUNGSTEN . . . BORON

Molybdenum is now available in unrestricted supply to improve strength and machinability. Dependable results are still one of its major attributes.

Tungsten, for hardenability and wearability improvement is now used in surprisingly small additions, with great success.

Boron, as an intensifier of the effects of other alloying materials, may be used in very minute additions, and yet maintain the essential properties of the castings desired. The most economical and satisfactory form to introduce Boron is recognized to be found in MCA's Ferro-Boron.

Operating the world's largest rare earth deposits, the Molybdenum Corporation of America has recently conducted extensive pioneering research in evaluating the properties, applications and uses of RareMeT Compound.

In nodular iron, small additions of rare earths have helped to produce consistently good ductility by counteracting subversive elements such as lead and titanium.

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to Develop Continuous, Automatic Heating, Quenching and Drawing Equipment

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to Pioneer and Perfect the Use of Endothermic, Exothermic and Other Special Atmosphere Treatments

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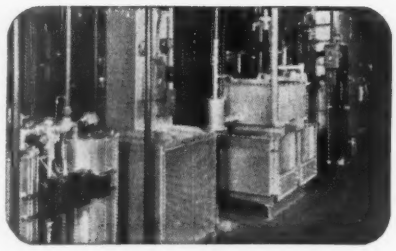
To Develop Continuous Furnaces Using Low Cost Atmospheres for Bright Annealing Ferrous and Non-Ferrous Tubing, Strip, Wire, etc.

FOR MORE THAN 35 YEARS THE INITIALS "EF" HAVE SYMBOLIZED THE MOST ADVANCED HEAT TREATING ACCOMPLISHMENTS

● To maintain and improve your competitive position, to get maximum efficiency, and economy, and utmost dependability and uniformity of finished product month after month, specify EF furnaces. Built in roller hearth, roller rail, chain belt, wire belt, car type, bell, rotary and many other designs,—furnished complete with special atmosphere generators, material handling facilities, and other accessory equipment to meet your specific requirement. Gas-fired, oil fired or electrically heated. Let EF engineers with their years of experience and many outstanding accomplishments work with YOU on YOUR next heat processing equipment problem.



EF exothermic generator, with refrigerator and dryer, producing atmospheres for bright annealing ferrous and non-ferrous products.

Gas-Fired, Oil-Fired EF *and Electric Furnaces*
for any Process, Product or Production
THE ELECTRIC FURNACE CO.
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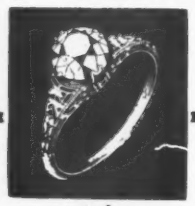
CASTINGS GLITTER LIKE



with

ASBURY

DIAMOND BLACKING
an all-purpose core and mold wash for sand castings, permanent molds and ingots.

For Quality Products
ASBURY GRAPHITE MILLS, INC.
ASBURY, NEW JERSEY
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Specialists for
Foundry Facings, Core Washes, Plumbagos, Mold Washes, Shake-On Facings, Head Compounds, Pipe Eliminators, Carbon Raisers.
IMPORTERS, REFINERS & GRINDERS OF GRAPHITE OF ALL TYPES FROM ALL OVER THE WORLD.

(*Continued from page* 226)

the future trends of the society, Mr. Donaldson indicated that there have been many "guesstimates" on the increase in capacity of the industry. The society believes that the most accurate figure for capacity is the maximum total demand calculated for the best consecutive six months' production in any year since 1946. He reported a 33 per cent increase since 1951 in the actual ability of the industry to produce, but also pointed out that as the ability has gone up, actual required production has gone down.

What Measures Efficiency?

Mr. Donaldson raised a question as to what is a measure of efficiency of operation in the steel castings industry. He pointed out that while there has been a tremendous increase in mechanization, undertaken to reduce costs and take better care of customers, the man-hours required for the production of a ton of castings has not gone down. In fact it has gone up. Mr. Donaldson questioned whether or not this situation might indicate that the industry may have reached a saturation point with regard to mechanization, whether it might have reached a state of equilibrium or whether production workers are able to maintain the status quo with regard to man-hours required. The speaker recommended that management study the problem, especially since greater mechanization may decrease flexibility to adjust in periods of low operation.

In conclusion, Mr. Donaldson indicated a definite need for a careful analysis of the scrap report in individual plants. The causes of scrap castings should be determined. For example, the analysis should point to the effect of the design on casting defects. Through the proper analysis and action, it is possible for management to discuss factors of design and defects with the customer. The standards by which the industry is judged are not static.

R. G. Parks, National Malleable & Steel Castings Co., Cleveland, and treasurer of the society, reported that the financial condition of the organization was never better.

Charles W. Briggs, technical and research director, in a brief report of activities, stated that the technical and research programs of the society are designed to provide improvement in quality of steel castings. This is the theme at T and O group meetings and at the annual T

(*Continued on page* 230)

...and again we want to remind you—

SAND IS ONLY PART OF THE PICTURE

Specify SMITH L-O CORE OIL for all your core making

If you have an unusual problem in core-making or casting, remember that sand is only part of the picture. The other part is the Smith representative in your territory and the Smith L-O Core Oil he will recommend for the job.

You can depend on this "combination", for the Smith foundry service man is well-qualified to cope with and solve problems . . . Smith L-O is of a uniform high quality that brings uniform results.

So, look first to Smith L O . . . the name that stands for a *service* as well as a *product.*

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MANUFACTURERS OF L-O AND CERTIFIED CORE OILS
INDUSTRIAL OILS DIVISION • ROCKFORD, ILLINOIS

(*Continued from page* 228)
and O conference He spoke of the success of the 1953 annual T and O conference which included 32 technical and operating papers by 38 authors. These covered the subjects of quality control, general sand practice, gating and risering, and hot tears. Mr. Briggs praised the work of the Safety Committee which has included a poster contest, safety contest, lost time and safety bulletins, and an exhibit of safety equipment at the T and O conference.

The Specifications Committee is the watchdog for specifications on a national basis, according to Mr. Briggs. The Technical Research Committee has had a heavy year with 15 projects active. Of the 15, 11 are studies designed to help members to produce better castings at lower cost. Mr. Briggs outlined a number of the projects and indicated that some of them would develop information which probably would surprise the industry. In conclusion, he stated that now is the time to bring production practice in line with high quality standards that must be maintained. He indicated that operating men can find much in the way of help in the research and in the technical and operating reports.

James H. Lowe, product development director, said that during the past year the Product Development Committee has been concerned with continuing improvement in quality of product, preparing a report on the 1952 survey of the industry, establishing minimum specifications for steel castings, and developing means of increasing sales. Records of the industry show that those foundries participating in the product development program are securing a greater share of present business than the average of the industry.

President McDonald announced four awards for excellence of articles presented during the past year in *Steel Foundry Facts,* the publication of the society. P. J. Neff, chief process engineer, American Steel Foundries, East Chicago, Ind., was awarded $50 for his paper "A Comparison of Acid and Basic Electric Furnace Melting for Steel Castings." H. E. Edsall, plant superintendent and F. E. Browne, service welding engineer, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., were awarded $50 for their paper "Casting, Cast-Weldment or Plate Fabrication." H. L. McClees, president, Crucible Steel Casting Co., Lansdowne, Pa., was awarded $50 for the paper "Material Handling in the Steel Foundry."

President McDonald also announced the steel foundries with outstanding records during 1953 and the accident frequency of each as follows:

Crucible Steel Co. of America, Harrison, N. J., 1.8; Chapman Valve Mfg. Co., Indian Orchard, Mass., 1.8; United States Steel Corp., Johnstown, Pa., 2.3; American Cast Iron Pipe Co., Birmingham, 2.6; General Steel Castings Corp., Granite City, Ill., 2.8; Duriron Co., Dayton, O., 3.7; Falk Corp., Milwaukee, 4.4; Mackintosh-Hemphill Co., Midland, Pa., 4.6; Hartford Electric Steel Corp., Hartford, Conn., 4.9; Continental Foundry & Machine Co., East Chicago, Ind., 5.2; General Steel Castings Corp., Eddystone, Pa., 5.5; American Steel Foundries, East St. Louis, Ill., 5.7; Ross-Meehan Foundries, Chattanooga, 5.7; United Engineering & Foundry Co., Vandergrift, Pa., 5.9; Grede Foundries Inc., Milwaukee, 6.6.

Symington - Gould Corp., Depew, N. Y., 7.2; National Malleable & Steel Castings Co., Melrose Park, Ill., 7.3; American Steel Foundries, East Chicago, Ind., 7.7; Continental Foundry & Machine Co., Wheeling, W. Va., 7.8; Hughes Tool Co., Houston, Tex., 8.3; National Malleable & Steel Castings Co., Sharon, Pa., 9; American Steel Foundries, Granite City, Ill., 9.3; Calumet Steel Castings Corp., Hammond, Ind., 9.4; National Supply Co., Torrance, Calif., 9.6; Birdsboro Steel Foundry & Machine

(*Concluded on page* 235)

Meetings of Interest to Foundrymen

May 3-5—Air Pollution Control Association, annual meeting, Patten Hotel, Chattanooga

May 4-7—American Welding Society, national spring technical meeting, Hotel Statler, Buffalo

May 5-7—American Society of Training Directors, annual conference, Hotel Schroeder, Milwaukee

May 5-7—American Welding Society, welding and allied industry exposition, Buffalo Memorial Auditorium, Buffalo

May 8-14—American Foundrymen's Society, annual convention and exhibition, Public Auditorium, Cleveland

May 16-19—Industrial Furnace Manufacturers Association, spring meeting, the Homestead, Hot Springs, Va.

May 17-20—Basic Materials Exposition, International Amphitheater, Chicago

June 9-11—American Society for Quality Control, annual convention and exhibit, Hotel Jefferson, St. Louis

June 14-15—Malleable Founders' Society, annual meeting, Seigniory Club, Province of Quebec, Canada

June 14-18—American Society for Testing Materials, annual meeting, Hotels Sherman and Morrison, Chicago

June 20-23—National Metal Trades Association, ninth annual plant management conference, French Lick, Ind.

Sept. 13-20—Instrument Society of America, International Instrument Congress and Exposition, Convention Hall and Commercial Museum, Philadelphia

Sept. 27-28—Steel Founders' Society of America, fall meeting, the Greenbrier, White Sulphur Springs, W. Va.

Oct. 6-8—National Foundry Association, 56th annual meeting, La Salle Hotel, Chicago

Oct. 14-15—Michigan Regional Foundry Conference, University of Michigan, Ann Arbor, Mich.

Oct. 14-16—Foundry Equipment Manufacturers' Association, annual meeting, the Greenbrier, White Sulphur Springs, W. Va.

Oct. 27-29—Grinding Wheel Institute & Abrasive Grain Association, fall meeting, Edgewater Beach Hotel, Chicago

Nov. 1-5—American Society for Metals, National Metal Congress and Exposition, International Amphitheater, Chicago

Nov. 11-12—Gray Iron Founders' Society, annual meeting, the Homestead, Hot Springs, Va.

Dec. 1-4—American Institute of Mining & Metallurgical Engineers, electric furnace steel conference, Hotel William Penn, Pittsburgh

You saw
B&P
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at
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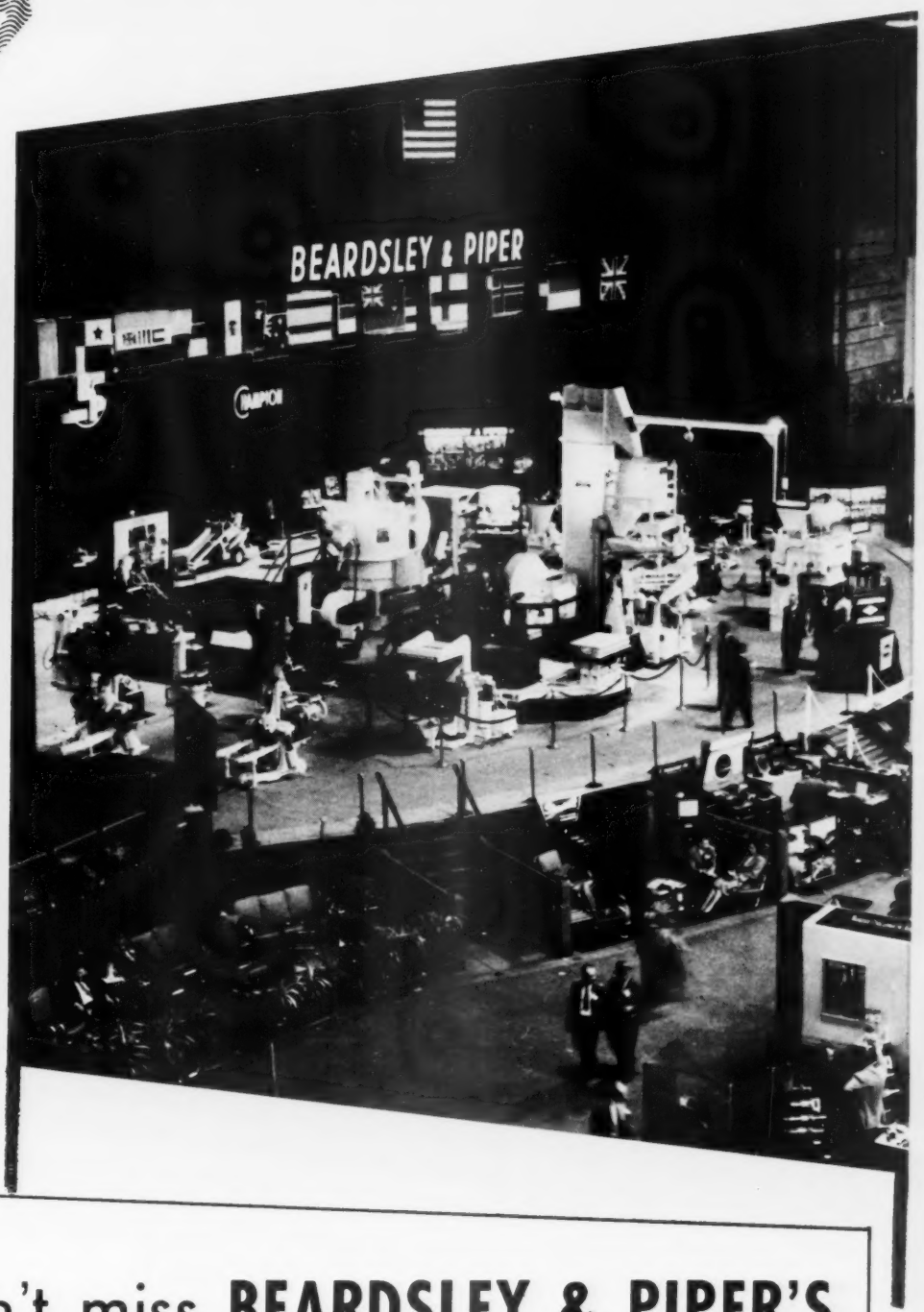
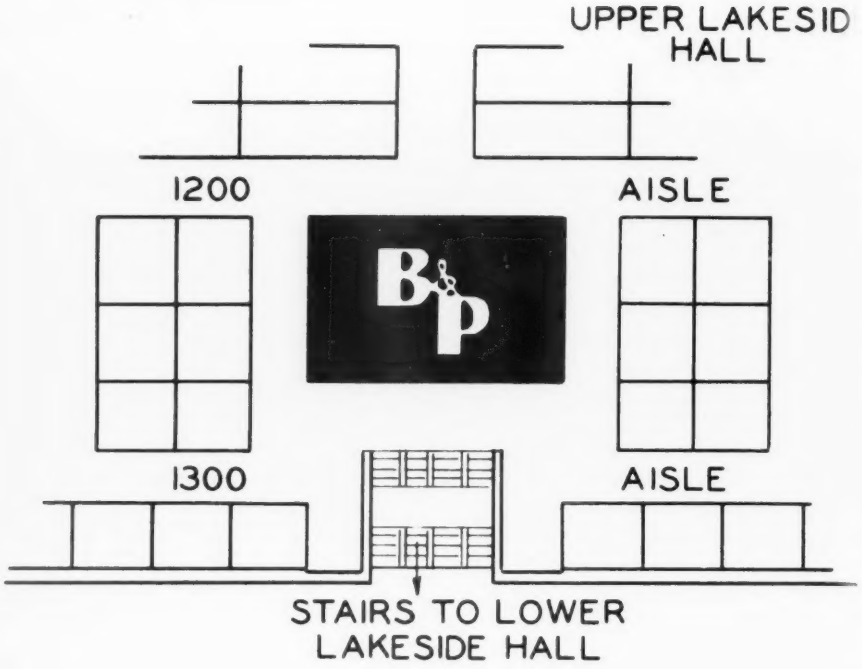


don't miss **BEARDSLEY & PIPER'S**
"PREVIEW OF THINGS TO COME"
at **Cleveland**

BOOTHS 1218 to 1226 and 1327 to 1333

BEARDSLEY & PIPER'S "PREVIEW OF THINGS TO COME"



SHELL MOLDING and SHELL BLOWING

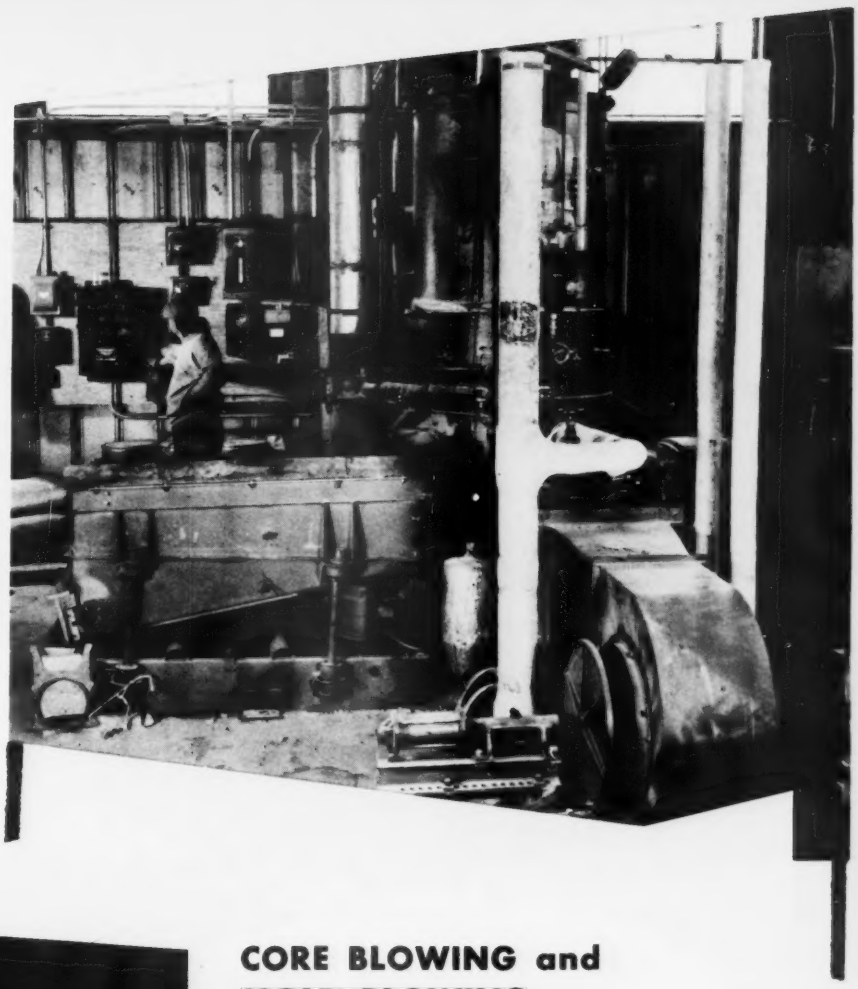
For the first time at any exhibit, both shell molding and shell blowing machines will be displayed.

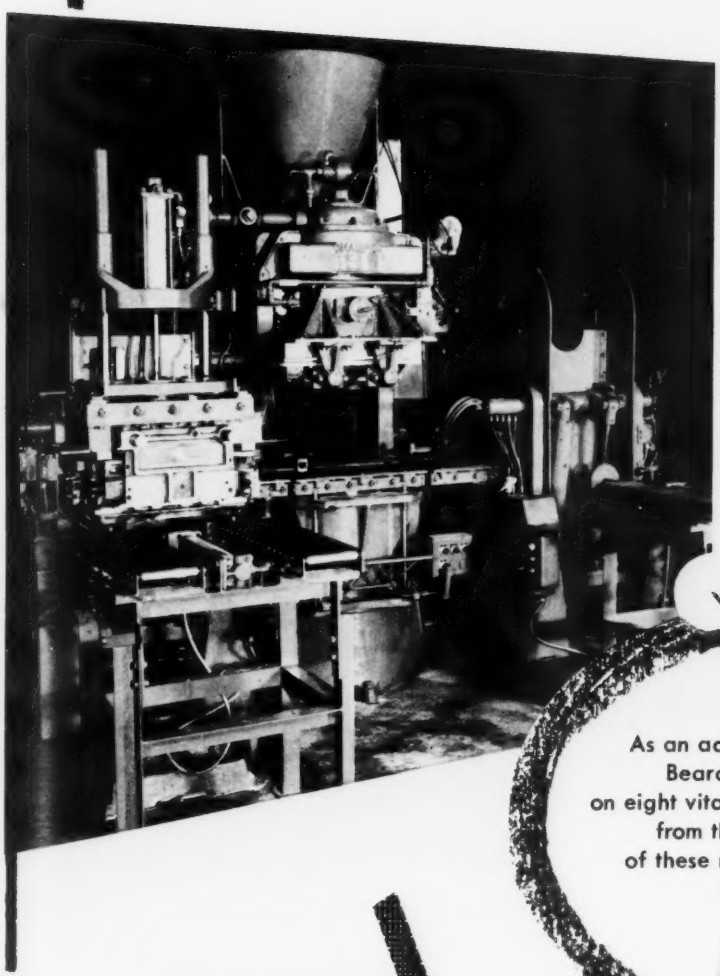
If your foundry is now using or contemplating the use of shell molding or shell blowing, this advanced line of machinery will be of vital interest to you.

Don't miss it . . . at booths 1218 to 1226 and 1327 to 1333.

GREEN SAND and SHELL MOLDING SAND PREPARATION

The new Special Speedmullor for the preparation of resin coated shell molding sands . . . the unit that cuts resin costs in shell molding by as much as 50%. And—in operation—a Speedmullor-Preparator Unit —the unit that has revolutionized the sand preparation practice of the jobbing foundry. See the latest in sand preparation at booths 1218 to 1226 and 1327 to 1333.





CORE BLOWING and MOLD BLOWING

On display and in operation . . . advanced Champion FLEXIBLO core blowers with new core handling equipment that will set new standards for core production.
For the first time at any foundry show . . . the Champion FLEXIBLO mold blower . . . one of the outstanding machine developments at the 1954 foundry show . . . at booths 1218 to 1226 and 1327 to 1333.

plus

THE B & P MOVIE THEATRE

As an added feature at this packed foundry exhibit, Beardsley & Piper will present for the first time, movies on eight vital foundry operations. See modern foundry techniques from the comfort of an arm chair at the B&P booth. All of these movies in sound and a couple in 3D . . . at booths 1218 to 1226 and 1327 to 1333.

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A Few of the

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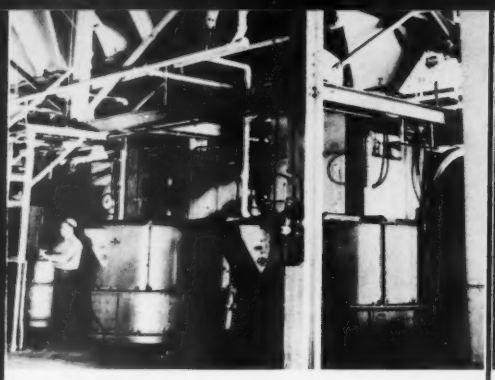
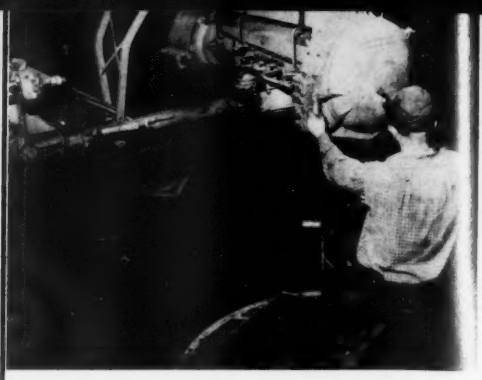
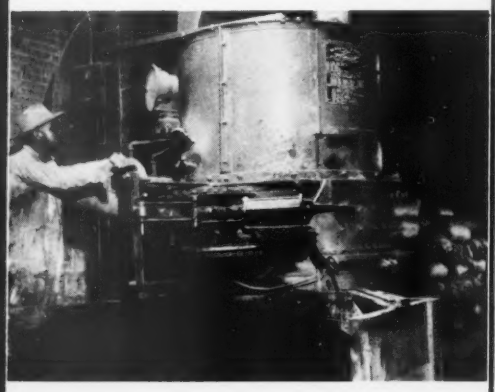


Three of twenty-four Speedmullors that mull all of the molding sand for Ford's new Cleveland foundry.



Head room is only twelve feet, but a Motive Sandslinger handles all of Meech Foundry's work.

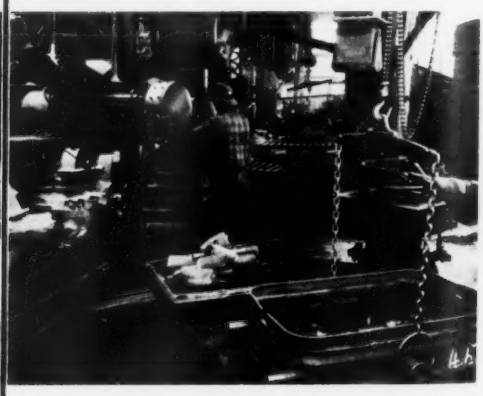


At Ohio Foundry this Model "50" Speedmullor prepares all of the facing sand for side floors.

This Jr. Nite Gang at Kasper Foundry, Elyria, Ohio, does a thorough job on side floor backing sand.

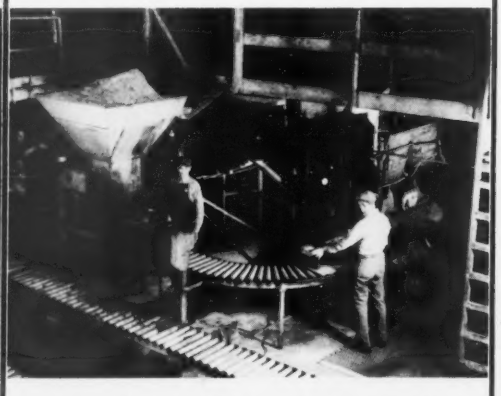
Duplex Foundry obtains the advantages of system sand preparation with this Speedmullor-Preparator Unit.

A Model "40" Speedmullor and a Model 3½ Mulbaro prepare all of the core sand at Harsch Bronze.



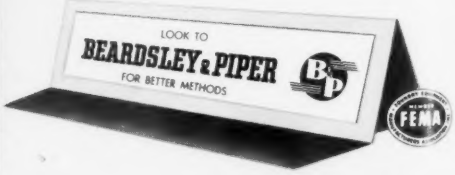
This Slinger-Rotomold unit with Champion Speed-Draw Machines handles West Steel's jobbing work.

Large molds are produced in quantity on this J & J 920 RB Rol-A-Draw at Electro Alloys, Elyria, Ohio.



A Champion CB-400 production coreblowing unit blows drawbar cores at American Steel Foundries, Alliance, Ohio.

B & P equipment is doing a real job in Cleveland . . . it can do the same in your foundry.



DIV. PETTIBONE MULLIKEN CORP.
2424 N. Cicero Avenue,
Chicago 39, Ill.

(*Concluded from page* 230)

Co., Birdsboro, Pa., 9.7; Los Angeles Steel Casting Co., Los Angeles, 9.8.

Members were privileged to see a film, "Forging in Closed Dies," which was produced by the Drop Forging Association.

Earle M. Layman, director of personnel, General Steel Castings Corp., Granite City, Ill., and chairman of the Safety Committee, pointed to the industry's progress in safety during the year. Many companies have seen the light and these will be rewarded in many ways, but principally in reduction of cost and improvement in employee relations. Many in the industry now realize that safety pays, but the committee will not be satisfied until each company is working for improved safety.

Progress in safety is shown by statistics for the past three years. In 1951 the industry reported 3509 lost-time accidents, with a frequency rate of 28.9 and a severity rating of 1.88. In 1952 there were 3027 lost-time accidents with a frequency of 23.9 and severity of 1.7. In 1953, reports showed 2373 lost-time accidents, a frequency of 19.2 and severity of 1.1. Had accidents in 1953 been at the 1951 rate, an additional 1150 men would have been injured.

Must Set Good Example

Mr. Layman emphasized the fact that safety is a personal thing. Management cannot expect employees to want to be safe unless those heading the company want them to be safe. A good boss must set an example, and, of course, a good accident-prevention program reflects good management. In conclusion, Mr. Layman stated that basic safety is the most important thing we need in foundries.

Discussing "The Short Range and Long Range Business Outlook for America," Dr. Philip Wernette, professor of business administration, University of Michigan, Ann Arbor, Mich., stated that the United States never again would have a major depression. Important factors responsible for the depression of the thirties no longer are present. Furthermore, both government and industry know much more about preventing depressions.

Dr. Wernette stated that the present recession is not going to be severe, and that it will flatten out. He sees no immediate return of a boom. He expressed the opinion that the United States recently has been going down to full employment. Industry is really getting back to normal conditions.

Looking to the future, the factor of population growth will become far more important than it seems at present. Over a considerable period, this increase has been 15 per cent per decade. This decade already has had an increase of 16 or 17 per cent, and if this rate continues, Dr. Wernette predicts the possibility of the population's doubling by 2000 A.D.

The steady rise in the per capita income, associated with shorter hours of work, introduction of new commodities, and great developments should provide ever growing markets. The speaker estimated that the population would increase from 174 million in 1960 to 304 million in 2000, that the per capita income would increase from $2100 to $4320 in that period, and that the national income would spiral from $365 billion in 1960 to $1300 billion in 2000.

Possible hindrances include a disastrous war which would result in great damage to the United States, or a decline in the spirit of enterprise, or in moral and spiritual values.

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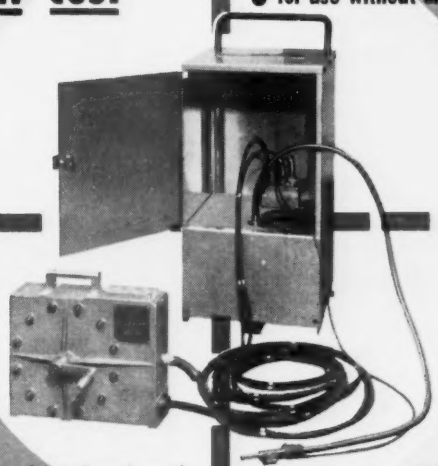

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FOUNDRY DEVELOPMENTS

By EDWIN BREMER

Metallurgical Editor

Jet type oil burners in preheating hood • Application of vacuum to pressure die casting • Centrifugal force filters molten metals • Dry ladle rapidly • Zinc in rubber latex paint protects iron and steel

BRITISH steelmaker, according to the February isue of *Metallurgia* (Manchester, England), has developed a duplexing procedure comprising a special oil-fired preheating unit and a 10-ton electric arc furnace. The preheating hood is equipped with six special oil burners based on the principle of a jet engine combustion chamber which are capable of burning 40 gal of oil per hr, each using heated air from a recuperator in the waste gas system. While the burners have been operated at full capacity for extended periods, and the practicability of melting by the method has been established, it remains to be seen whether the economics are attractive.

* * *

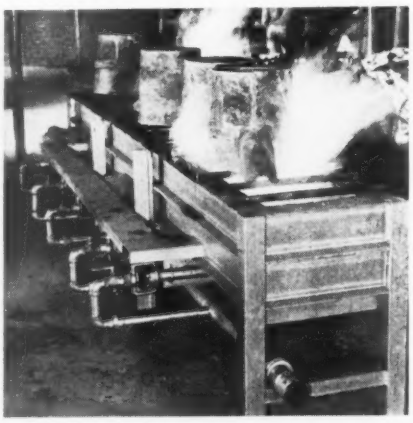
CLEVELAND firm claims to have developed a new vacuum die casting method and equipment for zinc alloys which seals a standard die for relatively high evacuation before injection of the molten metal. It is said the new method greatly reduces internal porosity, increases skin thickness and hardness, and increases tensile strength. Vacuum casting process employs a standard die casting machine operating under semi-automatic electric controls. Some die adaptation is necessary for purposes of holding a vacuum, but the die can be returned to its former use with no impairment to its original condition.

* * *

EXPERIMENTS indicating the possible advantage of using centrifugal force instead of gravity filtration for separating the solid and liquid phases of molten alloys are described in Report of Investigations 5007 available from the Bureau of Mines, 4800 Forbes St., Pittsburgh 13. Entitled "Centrifugal Separation of Liquid and Solid Phases from Some Binary Alloys," the report was prepared by A. K. Schellinger and M. J. Spendlove, and describes development of a small centrifuge and its use to separate intermetallic compounds. Essentially the apparatus is a 3-in. spinner pot revolving at speeds up to 3000 rpm in a gas-fired furnace. Comparisons show separation can be well over 90 per cent. Centrifugal separation of iron-tin intermetallic compound from molten tin appears feasible and more rapid and complete than industrial filtration procedures now used.

* * *

DRAPER Corp., Spartanburg, S.C., recently converted to use of natural gas for fuel to heat its core ovens, normalizing furnaces, boilers, space



heating, lighting up the cupola, and drying and heating its ladles. As shown in the accompanying illustration, the ladle drying and heating unit was constructed so that the ladles could be inverted over the gas burners, which are located 8 in. below the rack supporting the ladles. It is claimed that the arrangement increases fuel economy and speeds up drying time. (Photo courtesy of Piedmont Natural Gas Co. Inc.)

* * *

ACCORDING to National Rubber Bureau, Washington, iron and steel can be protected from weathering through application of metallic zinc in a rubber latex vehicle. Material can be applied by brushing or spraying, and is said to be touch-dry in 14 minutes, and hard-dry within 40 minutes. It is claimed that the material can be applied over adherent rust or scale without necessity of cleaning the surface of the iron and steel by abrasive blasting or chemical action.

* * *

INVESTIGATION of the oxidation of aluminum-magnesium alloys by steam, by Marjorie Whitaker as reported in the November, 1953 issue of the *Journal* of the Institute of Metals (London), led to the conclusion that 0.004 per cent Be is the optimum addition for the inhibition of mold reaction in castings of the Al-10 per cent Mg alloy. This was confirmed by foundry work. Inhibiting action of Be is not reduced by degassing the melt with chlorine, nitrogen or hexachlorethane, nor by use of melting fluxes based on chlorides of magnesium and potassium. The impurities carbon, iron, silicon, copper, calcium and potassium and the grain refining elements boron and titanium also are harmless. Sodium reduces inhibiting effect; 0.06 per cent practically destroys it.

* * *

INVESTIGATION of "Application of Cesium 137 to Industrial Radiography" by J. W. Dutli and G. M. Taylor which appears in the March-April issue of *Nondestructive Testing*, indicates that this isotope is a suitable gamma radiographic source comparable with cobalt 60 and radiographically similar to 1000 pkv x-rays. Cesium 137 has a half-life of 37 years with an emission of 0.66 Mev in 95 per cent of the disintegrations, and is said to be low in cost.

Thread-like Thermocouple

UNIQUELY designed thermocouple has been developed by Dr. W. G. Rauch, Argonne National Laboratory, Lemont, Ill. Made for measuring temperatures inside fuel elements of operating nuclear reactors, the thermocouple is only slightly thicker than a standard hypodermic needle. Due to its thinness, flexibility and ruggedness it can be threaded through small winding passages into places which cannot be reached by conventional thermocouples.

Construction consists of inserting thin insulated constantan (Cu-Ni-Mn) wire into small-diameter Inconel (Ni-Cr-Fe) tubing and drawing through a die. Wire and tube form the couple which is said to develop twice the emf of conventional couples. Ones that have been developed are 0.04-in. in diam and 20 ft long, and have been used in measuring temperatures up to 1250°F.

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AROUND THE COUNTRY

NEWS REPORTS FROM

Cleveland
Philadelphia
New York
Chicago

Cleveland . . .

ANNUAL Redesign Contest rules have been announced by the Gray Iron Founders' Society. The society is offering three prizes totaling $850 for the best examples of a redesign of a competitive product for production in gray iron. June 1 is the closing date for entries.

The contest is open to all persons engaged in the metalworking industry, and entries may be entered by individuals or jointly by two or more individuals. Entries should include an 8 x 10-in. photo of the gray iron application and, if possible, a similar photo of the original product or component. They should also include a description of why the product was redesigned, how much was saved in labor and material costs, how much efficiency was gained and any other pertinent facts.

The prizes include $500 for first place, $250 for second and $100 for third. Entries should be addressed to Redesign Contest, Gray Iron Founders' Society, National City-East 6th Bldg., Cleveland 14.

Philadelphia . . .

FOUNDRY activity generally is showing definite improvement. This applies to both ferrous and nonferrous shops, barring possibly the light metal shops, whose backlogs are down substantially from what they were several months ago, but are still larger than in the other types of casting.

Gray iron jobbing foundries now are averaging 75 to 80 per cent of normal, with most running nearer five days than four. Not long ago they were doing well to maintain a four-day average. Further, backlogs are building up a little, now averaging three weeks, as against two weeks less than a month ago. Pressure pipe people are running at virtually 100 per cent of normal, reflecting in particular seasonal building influences.

While little business is coming from the railroads and from manufacturers of heavy trucks, malleable shops have been able to improve their position through a better flow of fittings and agricultural equipment business. These foundries are now averaging around five days a week and have stepped up their backlogs to around six weeks. Steel foundries are moderately active at around 70 per cent of normal, with most units running four and a half to five days per week. They miss the defense work that was shooting their backlogs many weeks ahead a year ago, but, nevertheless, still have a comfortable operating cushion. Most steel foundries have at least six weeks' work on hand.

However, competition is still keen and this is true in all foundry categories. Foundrymen are breathing somewhat easier than they were a month ago, but still realize they have a selling job to do if they are to no more than maintain present operations.

Meanwhile, despite the fact that four blast furnaces—three at Steelton, Pa., and one at Swedeland, Pa.—went out of blast in this district in April, there has been no dearth of pig iron. At least one pipe shop, it is understood, has turned to foreign sources for substantial quantities, but it was the attractiveness of foreign prices that caused it to do so. Some European foundry iron has been purchased at around $47 on cars, Philadelphia, duty paid, or approximately $12 under the domestic market. Cast scrap is ample but a little firmer in price.

The larger bronze and brass shops are operating at full normal; the smaller shops, which in most cases haven't quite the facilities for handling precision work, are not doing too badly, either. None, so far as can be learned, are operating at less than four days a week. Aluminum and magnesium shops are experiencing a decline in orders, with aircraft and radar work dropping. However, they are operating at full time and have backlogs averaging possibly three months.

New York . . .

DEMAND for ferrous castings shows little gain. Gray iron shops are operating at a maximum of four days a week, with the average less and with backlogs amounting to about two-weeks' operation. A foundry at Dover, N. J., engaged in miscellaneous gray iron work, has suspended operations completely for the time being due to a lack of business. Little improvement is in early prospect.

Steel and malleable shops are faring a little better. Malleable foundries appear to have three to four weeks' work on hand and steel shops five to six weeks' work. Both the malleable and steel foundries are operating at around four to five days, although with limited working forces.

Brass and bronze shops are gaining some headway. There is definite improvement in specifications from meter, pump and valve manufacturers, and there is a better jobbing business. Only a reasonably good demand from the shipyards is needed to impart a real touch of briskness. One large manufacturer of maritime precision instruments is increasing operations some (although not finding it necessary to add to its employment), but the maritime business in general is decidedly dull. Bookings at aluminum casting plants are declining, but operations are normal and operators still have fairly good backlogs.

Chicago . . .

NOW it is official that the big magnesium foundry at the Aircraft Engine Division of Ford Motor Co., here, will be closed down, but it will be sometime this fall instead of midyear as this column reported last month. The facility, already sharply curtailed, will be held in standby condition.

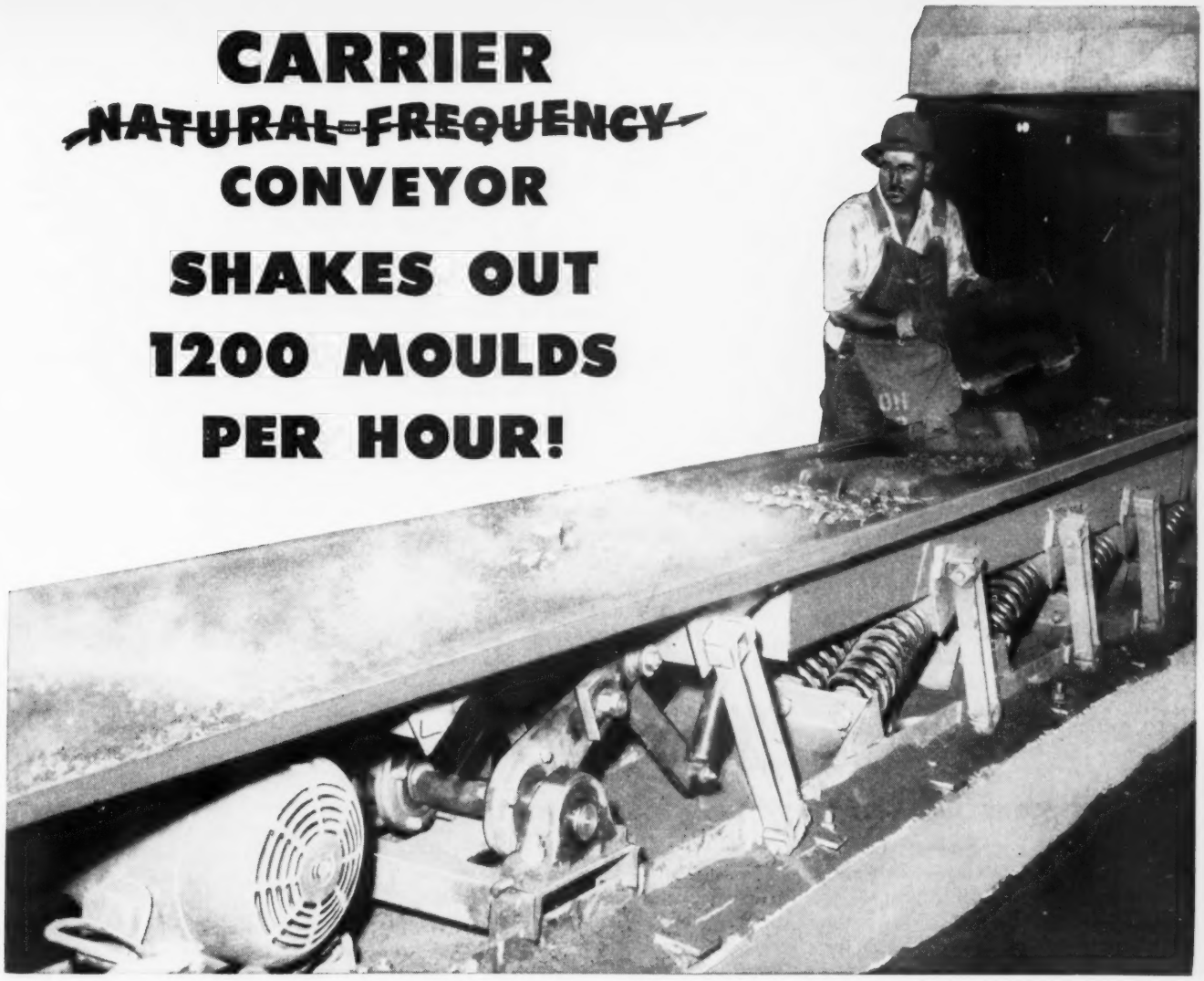
Company spokesmen state that continued operation of the foundry cannot be justified economically by requirements of castings for the Pratt & Whitney J-57 turbojet engine, which is now rolling into assembly-line output as replacement for the Pratt & Whitney R-4360 28-cylinder reciprocating power plant made since March, 1952, and now being phased out to conclusion late this year. The R-4360 engine required about 15 major magnesium castings, the J-57 only 5. By weight, the need is considerably less than the 3 to 1 numerical ratio. Future castings requirements will be purchased.

The plant, which has made over 2000 of the reciprocating engines, had its first production-line jet engine accepted by the Air Force Apr. 5 and thus made delivery more than two months ahead of schedule.

To expedite engineering changes in the J-57 manufacturing program

(*Concluded on page* 240)

CARRIER ~~NATURAL-FREQUENCY~~ CONVEYOR SHAKES OUT 1200 MOULDS PER HOUR!



The 35-foot, 5 H.P. Natural-Frequency Conveyor shown above is a real glutton for punishment. It shakes out and conveys 1200 8x14x16 moulds of brass castings per hour — a rugged, heavy-duty job involving from 60 to 100 tons of sand per hour, plus castings!

Carrier Natural-Frequency Conveyors are now delivering spectacular conveying and shakeout performances for scores of foundry operations throughout the country—from the smallest precision castings on up to extremely large, heavy castings. Mail the coupon for all the facts, *today!*

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"The performance of this conveyor is very adaptable to our type of work. The long length of the conveyor gives ample time for the separation of the sand from the castings and the removal of the bottom board. It also helps keep different types of castings separated."

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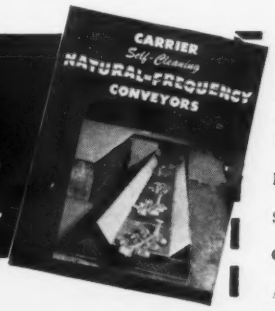

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(*Concluded from page* 238)
and to help boost parts production in critical spots, the Aircraft Engine Division has established a semi-production department. Present plans call for inclusion of a Kirksite foundry equipped with a molding and pouring area. This foundry would make dies of Kirksite to be utilized for short-run production of formed sheet metal parts.

Foundries in this area are holding inventories of raw materials to a minimum and are buying additional supplies as their melting rates rise with new orders for castings. Sellers of pig iron and coke report that phone calls for one or two cars of pig iron or coke for immediate shipment are getting more numerous. There is enough of this kind of buying, however, to keep current sales equal to those of the previous month.

Although foundry operations are spotty, with some shops operating at a fair clip and others only three or four days a week, optimism holds for better business ahead.

With steel mills here running only at around 75 per cent of capacity and with demand for foundry pig iron off, 14 of Chicago district's 43 blast furnaces are idle. At no time since mid-1940, save for several steel and coal strike dislocations, have blast furnace operations been so low as they are now.

AMA Issues Booklets on Management Topics

American Management Association has issued several booklets in its manufacturing, office management and personnel series. Booklet 213 in the manufacturing series, "Building Up the Supervisor's Job," contains four articles pertaining to communication with the foreman, his status in the organization, a critical look at his salary and a paper on line management's responsibility for human relations.

Booklets 134 and 135 in the office management series are entitled "The Human Side of the Office Manager's Job" and "Streamlining Office Equipment and Services," respectively. The former contains five articles on methods of increasing office productivity, getting participation in planning, salvaging the problem employee, an integrated human relations program in a small company and how to obtain spirit in an organization.

Booklets 154 and 155 in the personnel series are entitled "Essentials of Effective Personnel Administration" and "Motivation: The Core of Management," respectively. Booklet 154 presents eight case studies of successful company experience in various administrative problems. Booklet 155 provides five articles on various aspects of motivation, group behavior, kinds of learning and what makes people do the things they do.

The books can be purchased from the association at 330 West 42nd St., New York 36, for $1 each to members, $1.25 to nonmembers.

Investment Casting Institute Plans Meeting

THE recently organized Investment Casting Institute has scheduled a general meeting to be held in Cleveland on Friday, May 7, at the Hotel Carter, prior to the opening of the AFS national convention. All manufacturers of investment castings are invited to attend.

The institute also has announced some of the features of its current program: A comprehensive survey of the facilities and capacities of the industry, a survey analysis of investment casting users, preparation of a bulletin to review technical literature and the development of technical committees. Dr. Nicholas Grant, associate professor of metallurgy at Massachusetts Institute of Technology, is available to the industry through the Investment Castings Institute as a consultant.

Grouped together above are the officers and directors of the newly organized Investment Casting Institute. In the front row, from left to right, are: Ted Operhall, Misco Precision Casting Co., K. M. Bartlett, Thompson Products Inc., president of the institute, and W. A. Dubovich, Engineered Precision Casting Co. In the rear row, from left to right, are: Ken Yonker, Howard Foundry Co., R. S. Banister, Midwest Foundry, and R. D. Gumbert, Alloy Precision Casting Co.

Quality Control Subject of Purdue Course

An advanced course in quality control by statistical methods will be conducted for the eighth year at Purdue University, Lafayette, Ind., June 14-22. Practical applications of statistical methods are stressed in lectures, demonstrations and laboratories. The course is designed for those who have had the equivalent of an intensive course in statistical control and who want to learn more about the statistical approach to industrial and research problems. The applications of the course should be of direct benefit and use to production engineers, design engineers, inspectors, development engineers, research and laboratory workers, quality control supervisors, executives and others.

Instructors for the course are men with wide experience in teaching short courses and part-time courses in quality control to industrial men. The attendance will be limited to 50 men. Fee is $100 per person, which includes notebook, supplies, text material, specially prepared notes and a follow-up meeting to be held this fall.

Purchases Foundry Assets

Lynch Corp., Glass Machinery Division, Anderson, Ind., has purchased the assets of the Anderson Brass & Aluminum Foundry. The acquisition will permit the company to expand its production of nonferrous castings, a major portion of which have been purchased from outside sources. The Lynch Corp. manufactures glassforming machinery and packaging equipment.

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Vol. 1. SEPTEMBER, 1892. No. 1

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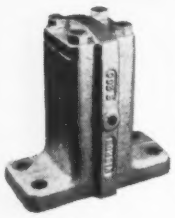

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Molding Sand Preparation—Past and Present

By A. A. WICKLAND
A. A. Wickland & Co.
Chicago

Ever since mankind acquired the knowledge of iron founding, the fundamental requirements of preparing natural sand for molding purposes have not changed. These include screening, wetting down, intensive mixing under pressure, cooling, screening and aerating before use.

Prior to the advent of power-driven machinery this work was performed manually, calling for muscle and brawn, in performing the work of hand screening, adding water, repeated shoveling, packing sand under foot or with the back side of a shovel, overnight cooling, and a second round of hand shoveling and screening, before the sand was used for molding.

Now Performed Mechanically

This laborious procedure is now performed mechanically. The advent of steam power, and later the electric motor, brought about revolutionary changes in methods and processes developed in conditioning molding sand. However, all essential requirements still remain, namely, removal of tramp iron, screening, moisture addition, mixing and blending under slight pressure, rest and cooling period, including repeated screening or aeration before sand is properly conditioned for reuse. It is apparent all these fundamental processes are met by power driven machinery, except the essential rest and cooling period.

With few exceptions present day continuous foundry operations are carried out about as follows: Molds are shaken out on a vibrating deck; the hot sand falls on an apron or oscillating conveyor below, and is disposed of on a belt passing over a magnetic pulley discharging onto a fast moving bucket elevator, delivering the sand on a vibrating screen above a large storage hopper. Lapse of time from the shakeout to the storage hopper is not over three minutes.

The discharge from the sand storage bin at the bottom generally consists of an auxiliary measuring hopper located above a muller; in some plants a plate feeder, belt conveyor and bucket elevator are used to fill the measuring hopper serving the sand muller. In either case, after

(*Continued on page* 244)

the crane with the BOARDING HOUSE REACH

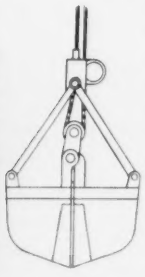
AUSTIN-WESTERN HYDRAULIC CRANE

with telescopic boom

It's the LIVE BOOM that puts the A-W Hydraulic Crane out front in the performance parade . . . live power with instant response for all boom movements . . . extending and retracting, raising and lowering, and rotating. Fingertip hydraulic control places the load exactly where it is wanted; handles delicate spotting jobs with superb precision. No other mobile crane has a boom so completely "alive" . . . no other outdoor-indoor crane will handle so many jobs, so well.

pped with magnet, it does a superb job of transport-heavy castings, changing tumbling barrels, and load-electric furnaces.

Yes, here's the answer to your materials handling bottleneck. Especially adaptable to foundry operations, the new Austin-Western Hydraulic Crane with its many attachments and simple one-man operation permits fast movement of large quantities of material—at the lowest possible cost.



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The hydraulic clamshell is the answer to high-speed handling of sand, slag, coke, coal, ashes, waste and other bulk materials.

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BOOTH No. 1915

(*Continued from page* 242)

mulling, the sand is discharged into a hopper and bucket elevator, thence into an aerator, discharged on a fast moving belt equipped with plows for delivery to the molding stations. Total time elapsed from the shakeout to the molder is perhaps less than ten minutes.

Early installation of sand preparation equipment for continuous molding operation was quite successful, perhaps due to the limited equipment available 50 years ago. The molds were shaken out by hand on a floor grating, a slow moving drag conveyor below the floor discharged it into a slow moving two-chain pocket elevator, thence into a revolving screen, which in turn disposed the sand on a flat belt conveyor. An operator was stationed at this juncture, assigned to control a water spray, adding water to the screened sand according to dryness and temperature, and this belt discharged the tempered sand into a pug mill or paddle mixer.

After a thorough mixing and initial cooling, the sand was deposited on a slow moving tempering belt of considerable length, thence to a secondary screen or aerator, which discharged it into a slow moving flight conveyor for delivery to the molders. No storage tank was used. Elapsed time from shakeout to mold was about 30 minutes. During its travel from the shakeout the sand was in constant slow motion, exposed to cooling air, also agitated many times, before final disposal into the mold. This simple process provided intensified mixing and cooling, essential to bring out the desired properties of the sand fully.

Numerous designs of continuous mullers have appeared during the past fifty years. One early design consisted of a belt-driven vertical shaft supporting a horizontal disk about 4 feet in diameter, having vertical equally spaced bars near its periphery. This device was located at the center of a vertical sand storage bin. The discharge from a bucket elevator was directed to fall on the rotating disk; due to the centrifugal action the sand passed between bars and was thrown horizontally some distance, before falling to the bottom of the bin.

Describes Other Devices

Another device of similar construction was in use at one time. A pinwheel or disk was mounted on a horizontal shaft within a housing. The sand was discharged at the center and thrown in all directions within the housing, falling through a hopper, directly above a belt conveyor, for delivery to the molding stations.

Still another device of considerable prominence years ago consisted of an inclined open-ended power-driven drum about 5 feet in diameter and 6 feet long. Within this drum was one pair of power-driven rollers facing each other, measuring about 6 inches in diameter, extending the full length of drum and beyond, with bearings mounted on supporting framing. These rollers were located in the center, parallel to the drum.

Sand to be treated was discharged at the receiving end of the drum below the rollers. Angle irons, acting as shelving within the drum, carried the sand upward until acted upon by gravity, the sand to fall directly upon the rotating rollers, which performed the mulling. This operation was repeated until the sand was discharged at the lower end of the drum.

The desirability of providing continuous mulling equipment is not

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- Sand Blasting
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new. In Europe, many years ago, a modified design of clay mixer was developed, consisting of a rotating pan or bowl, with two vertical muller wheels, free to rotate. The sand was fed at the periphery of the pan, passed under the rollers, and a portion of it was discharged continuously through an opening in the center of the pan.

It should be noted that the important time element required for mulling and cooling was overlooked in the early designs, and no material improvements were introduced until the American clay mixer method of mixing and mulling was improved upon and marketed, as batch mixers.

Present day batch mullers are indispensable in preparing sand to meet specific requirements, but their limitations become noticeable in preparing large tonnages of bedding sand uniformly conditioned and cooled, since the judgment, alertness and watchfulness on the part of the operator predominate in preparing sand in small batches.

With regard to sand conditioning equipment in general, large sand storage bins are indispensable, especially in jobbing shops and foundries, where periodical production of large or small molds alternates. Hot sand cools slowly when confined in a bin, and to secure the full advantage of large bins the sand must be cooled and moisture reduced somewhat before entering storage.

Sand adheres to the walls of storage bins, forming a circular pit or channel through the center, from top to bottom, reducing the effective volumetric capacity perhaps two-thirds. This condition is generally overlooked, and should be given due consideration in designing new equipment.

Book Review

1953 *Supplement, Book of ASTM Standards, Part 2, Non-Ferrous Metals,* paper, 278 pages, 6 x 9 in., published by the American Society for Testing Materials, 1916 Race St., Philadelphia 3.

This supplement contains extensively revised standards and tentatives which have been accepted by ASTM since publication of the 1952 *Book of ASTM Standards.* Contains eight standards of which seven are replacements of existing ones, and 41 tentatives. Of those 29 are replacements and 11 are published for the first time. Yellow stickers accompany the volume for insertion in the 1952 book to direct attention to changes in the standards and tentatives.

Upgrading of Southern Iron Ore Planned

National Lead Co. and Republic Steel Corp. are launching a joint project to upgrade southern iron ore and iron-bearing materials.

The project could be of great importance to the entire ferrous metal industry. Its success would result not only in the upgrading of ore now usable, but also in the utilization of mineral resources which are now of little economic value and have heretofore not been usable by the steel industry.

A large-scale pilot plant is now under construction at Republic's Spaulding iron ore mine near Birmingham, where production-scale studies of the contemplated upgrading project will be made. The pilot plant will be completed and in operation this summer. The iron ore concentrate to be produced is expected to be sufficiently upgraded to warrant its use in modern blast furnaces.

The joint project combines the broad experience of both companies

At the FOUNDRY SHOW

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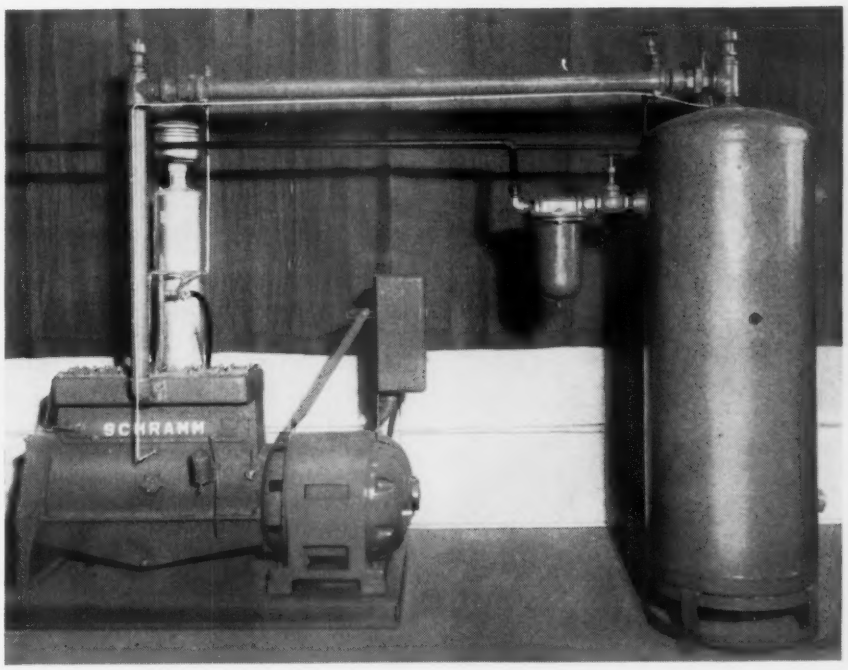

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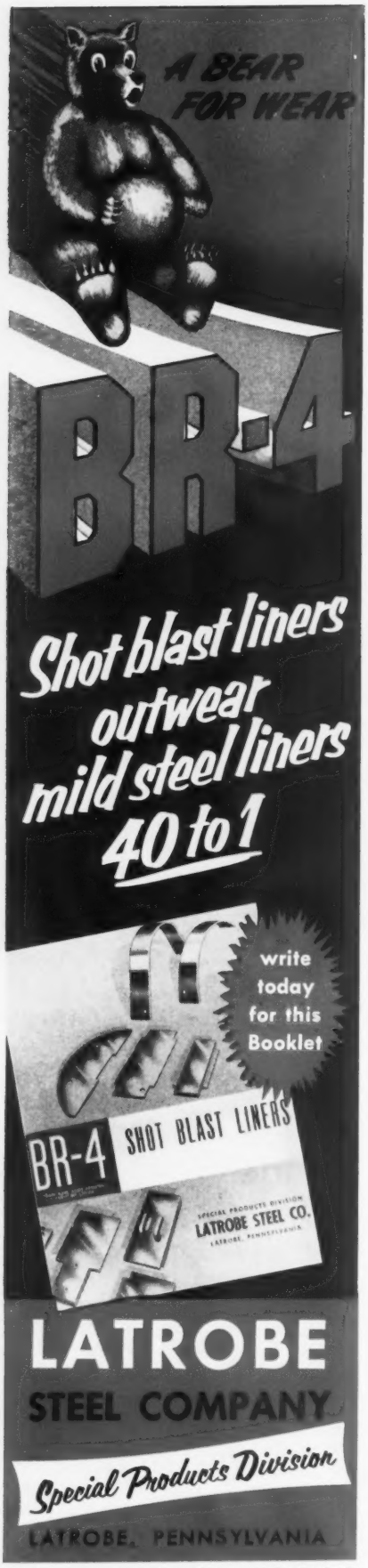

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American Foundrymen's Society
58th Annual Foundry Congress
and Show. Cleveland May 8-14

in closely related fields. The extensive experience of National Lead in the treatment of nonferrous ores supplemented by its extensive research in Norway during the last eight years is matched by Republic's experience with southern iron ore as well as in the beneficiation and use of low iron content southern non-magnetic materials.

Spokesmen for the two companies point out that, though there are still deposits containing millions of tons of high grade iron ore in the United States, these deposits are being rapidly depleted, and new sources of ore must be found as soon as possible.

The steel industry is partly meeting this situation in the North in three ways: First, through the program for beneficiating Minnesota magnetic taconite; the magnetic taconite deposits are vast but fall far short of nonmagnetic ore resources. Secondly, by the development of iron ore fields in the Quebec-Labrador wilderness. Thirdly, by importations of ore from abroad in sharply increasing tonnages making the American steel industry increasingly dependent on overseas mines for its iron ore.

Vast Quantities Available

However, the nation's reserves of low grade nonmagnetic iron ores and other materials too lean to be considered as ores today run into the billions of tons. Very little of this has been touched.

A method of upgrading these nonmagnetic ores, found not only in the South but in many other parts of the country, will materially assist in extending the usable iron ore reserves of the United States for many years.

There are large tonnages of such materials available in the South. They include the ferruginous sandstone of Alabama, the familiar Georgia ochre and similar materials in Tennessee, North Carolina, Virginia and many other states.

According to the United States Bureau of Mines, reserves of ferruginous sandstone in the Birmingham basin alone exceed a billion tons, with iron content running from 23 to 27 per cent. The production life of commercial ore from operating mines in the Birmingham basin is estimated by the Bureau of Mines at 41 years under today's economic conditions. By the addition of commercial ore from all other sources, marginal ore and the ferruginous sandstone reserves, however, the production life of iron minerals in the Birmingham basin may be extended to 235 years, the Bureau of Mines has estimated.

Foundry Show

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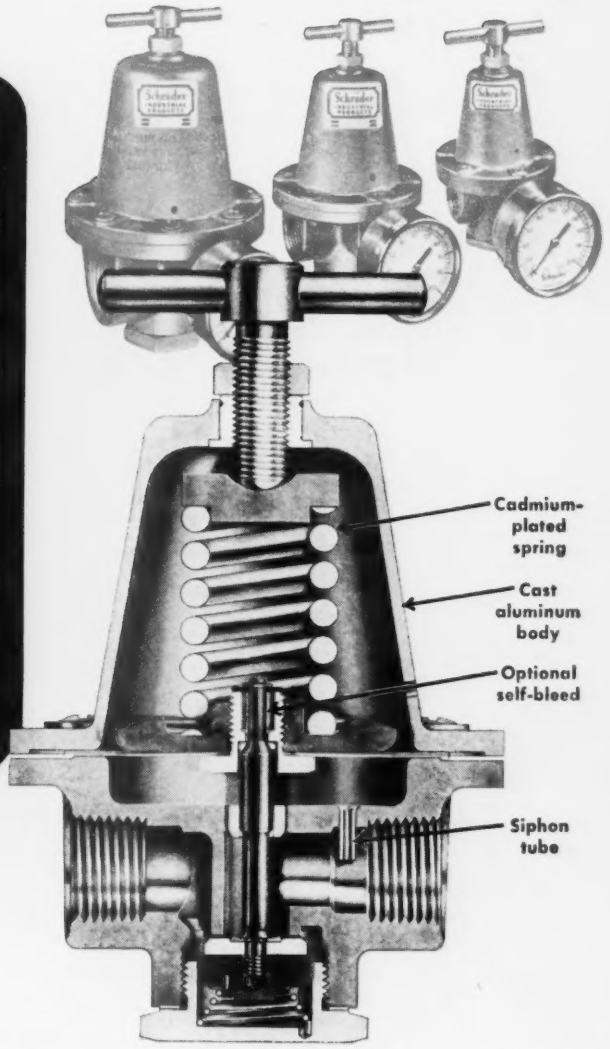

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FOUNDRY STATISTICS

MALLEABLE IRON

(Shipments of castings—net tons[1])

	Shipments		Unfilled Orders[2]
	Total	For Sale	
1951	1,085,241	656,076	.....
1952	926,120	573,472	.....
1953			
Jan.	87,249	53,272	174,809
Feb.	86,515	51,963	175,088
Mar.	94,481	57,025	177,776
Apr.	95,923	57,757	174,514
May	82,050	48,011	160,387
June	86,514	50,819	151,016
July	77,111	45,413	137,251
Aug.	73,855	45,415	120,801
Sept.	74,333	45,466	114,523
Oct.	73,473	45,515	104,046
Nov.	63,435	37,500	93,156
Dec.	72,126	39,657	95,612
Total	967,065	577,813	.....
1954			
Jan.	70,288	38,266	85,565

COPPER-BASE ALLOY

(Shipments of castings—1000 pounds[1])

	Shipments			Unfilled Orders[2]
	Total	Sand	Perm. Mold	
1951	1,197,443	1,075,437	69,883	.....
1952[3]	1,009,910	910,862	63,865	.....
1953[3]				
Jan.	85,781	76,686	5,388	80,793
Feb.	85,183	76,847	5,061	76,578
Mar.	92,798	83,639	5,716	69,490
Apr.	94,362	85,471	5,462	72,291
May	85,223	76,912	4,855	66,926
June	84,656	76,333	4,706	64,535
July	71,041	64,451	3,926	61,209
Aug.	78,357	70,557	4,890	63,419
Sept.	80,307	71,895	5,273	59,141
Oct.	83,661	74,221	5,775	53,867
Nov.	74,712	66,300	5,077	49,481
Dec.	77,669	68,814	5,082	47,922
Total	993,750	892,126	61,211	.....
1954				
Jan.	71,437	63,034	4,618	42,351

ALUMINUM

(Shipments of castings—1000 pounds[1])

	Shipments				Unfilled Orders[2]
	Total	Sand	Perm. Mold	Die	
1951	515,131	193,378	160,011	151,465	.....
1952[3]	518,979	194,616	146,883	169,732	.....
1953[3]					
Jan.	55,629	19,158	16,147	20,052	142,542
Feb.	54,864	17,583	16,698	20,272	148,557
Mar.	58,423	18,959	14,465	22,249	145,749
Apr.	61,582	20,009	18,583	22,620	141,231
May	57,602	19,600	16,479	21,208	138,037
June	56,820	19,330	15,535	21,675	136,437
July	51,653	16,664	15,733	18,915	126,426
Aug.	50,900	16,007	16,294	18,200	127,896
Sept.	53,694	17,818	17,215	18,245	122,049
Oct.	55,438	17,212	16,983	20,893	116,744
Nov.	51,405	16,209	15,349	19,409	108,698
Dec.	52,025	15,375	16,852	19,363	107,754
Total	661,035	213,954	199,733	243,107	.....
1954					
Jan.	50,927	14,667	16,118	19,718	103,781

MAGNESIUM

(Shipments of castings—1000 pounds[1])

	Shipments		Unfilled Orders[2]
	Total	For Sale	
1951	30,825	28,090	.....
1952[3]	34,857	32,977	.....
1953[3]			
Jan.	3,073	2,825	15,680
Feb.	3,225	3,033	14,834
Mar.	3,362	3,093	13,608
Apr.	3,294	3,046	12,709
May	2,679	2,434	13,635
June	3,136	2,666	13,664
July	2,372	2,084	13,840
Aug.	2,559	2,279	13,125
Sept.	2,524	2,236	12,454
Oct.	3,015	2,708	11,477
Nov.	2,677	2,413	10,619
Dec.	2,685	2,427	9,324
Total	34,601	31,244	.....
1954			
Jan.	2,451	2,149	8,800

PRODUCTION WORKERS

Estimated Number

(Thousands)

	Dec. 1953	Nov. 1953	Dec. 1952
Ferrous	195,700	196,900	226,300
Nonferrous	72,800	74,400	82,300

Average Weekly Earnings

Gray Iron	$74.03	$73.47	$73.40
Malleable Iron	72.77	71.63	76.61
Steel	79.20	76.24	82.76
Nonferrous	81.41	79.20	84.02

Average Weekly Hours

Gray Iron	39.8	39.5	41.1
Malleable Iron	38.5	37.9	41.3
Steel	39.6	38.7	42.4
Nonferrous	40.5	39.6	43.0

Labor Turnover Rate (Dec.)

(Per 100 employees)

	Total Accession	Total Separation	Quit	Layoff
Gray Iron	2.3	4.8	0.8	3.6
Malleable Iron	1.7	5.1	1.2	3.6
Steel	1.8	4.4	0.6	3.4
Nonferrous	2.5	7.3	1.1	5.6

Source: Bureau of Labor Statistics

GRAY IRON CASTINGS — SHIPMENTS

(Net tons[1])

	All Castings		Miscellaneous Castings		Heavy Steel Ingot Molds		Chilled Railroad Car Wheels	Pressure Pipe & Fittings	Soil Pipe & Fittings	Unfilled Orders[2]
	Total	For Sale	Total	For Sale	Total	For Sale	Total	Total[4]	Total[4]	
1951	14,988,555	8,453,046	9,573,347	4,471,539	2,614,517	1,257,542	639,996	1,473,192	687,503	.....
1952	12,862,494	7,373,757	8,095,299	3,794,164	2,238,309	1,070,252	544,896	1,312,518	651,472	.....
1953										
Jan.	1,161,945	622,392	730,216	324,330	252,181	118,514	38,385	93,930	47,233	1,333,255
Feb.	1,135,868	607,160	721,847	315,101	228,360	106,398	44,420	93,152	48,089	1,332,038
Mar.	1,264,271	674,720	800,390	341,656	250,447	119,630	41,414	114,885	57,135	1,375,886
Apr.	1,277,288	683,047	799,872	329,802	246,873	122,702	44,877	120,105	65,561	1,305,849
May	1,185,545	641,581	734,326	312,836	238,202	115,728	41,373	113,136	58,508	1,271,711
June	1,196,106	648,400	743,737	312,681	232,596	115,946	45,542	114,118	60,113	1,245,904
July	1,056,422	573,280	652,371	274,890	212,187	106,526	36,715	97,739	57,410	1,232,651
Aug.	1,069,392	588,543	646,902	286,449	217,930	107,428	40,327	107,805	56,428	1,222,612
Sept.	1,105,582	611,905	669,225	289,909	232,055	117,694	37,055	108,270	58,977	1,170,191
Oct.	1,141,526	650,229	669,757	300,249	245,966	124,177	41,917	118,306	65,580	1,075,538
Nov.	1,004,326	563,930	589,657	266,039	227,800	111,022	31,373	101,576	53,920	977,012
Dec.	1,032,444	552,565	634,250	274,203	228,532	108,700	30,051	94,053	45,558	954,885
Total	13,630,715	7,417,752	8,392,550	3,537,645	2,813,129	1,374,465	473,449	1,277,075	674,512	.....
1954										
Jan.	932,298	488,497	607,755	261,164	154,359	60,947	31,316	90,898	47,970	871,918

STEEL CASTINGS — SHIPMENTS

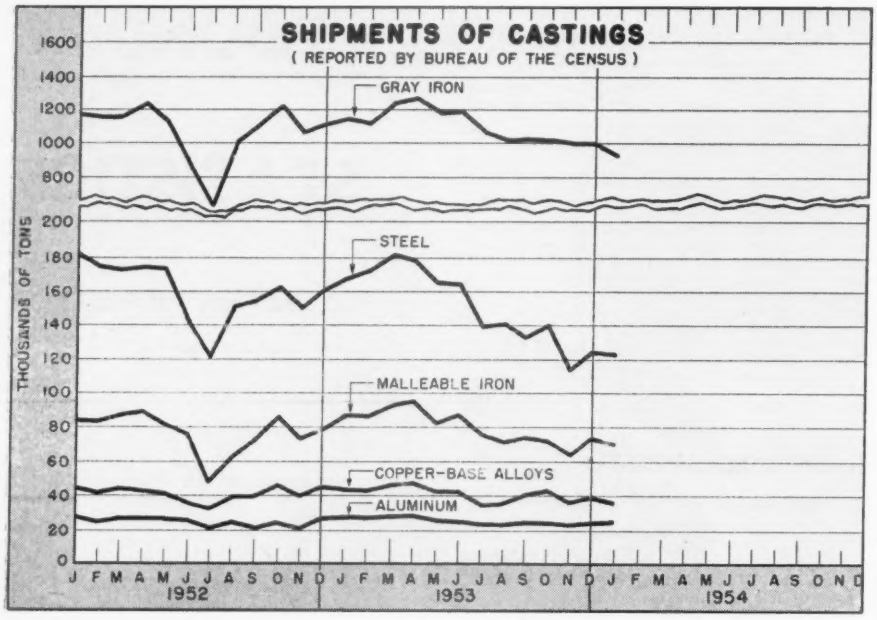
(Net tons[1])

	All Castings			Carbon Steel			Alloy Steel			Unfilled Orders[2]
	Total	For Sale	Railway Specialties	Total	For Sale	Railway Specialties	Total	For Sale	Railway Specialties	
1951	2,050,054	1,506,903	466,172	1,541,280	1,162,687	415,915	508,574	344,216	50,157	.....
1952	1,925,707	1,476,746	342,561	1,496,450	1,053,264	298,948	553,403	430,493	40,613	.....
1953										
Jan.	167,211	126,819	27,150	118,423	89,050	24,788	48,788	38,121	2,362	706,490
Feb.	175,675	137,592	33,156	122,624	94,991	29,828	53,051	43,495	3,328	644,302
Mar.	182,181	141,873	34,364	129,055	100,069	31,772	53,126	42,286	2,592	634,600
Apr.	179,615	140,051	34,035	128,457	99,602	31,212	51,158	40,938	2,823	573,565
May	165,649	126,380	29,552	117,318	88,781	26,888	48,331	38,036	2,664	328,931
June	164,665	125,984	30,381	116,358	88,260	27,767	48,307	38,130	2,614	475,756
July	139,577	105,687	22,925	95,891	71,488	20,938	43,686	34,532	1,987	467,900
Aug.	141,340	107,941	25,026	97,076	73,784	22,637	44,264	35,003	2,389	418,927
Sept.	135,303	102,880	24,108	95,944	72,780	21,724	39,359	30,338	2,384	327,172
Oct.	140,702	106,788	25,354	100,568	76,118	23,449	40,134	30,988	1,905	313,684
Nov.	114,088	84,945	17,784	79,989	57,947	16,233	34,099	27,167	1,551	308,526
Dec.	123,281	91,017	18,685	86,465	62,377	16,998	36,674	29,952	1,687	278,389
Total	1,829,287	1,397,957	322,520	1,288,168	975,247	294,234	540,977	428,986	28,286	.....
1954										
Jan.	122,758	93,577	21,025	83,927	62,749	19,235	38,831	30,828	1,790	251,690

[1] Source: Bureau of Census. [2] For sale only. [3] Based on new sampling method; not comparable to prior figures. [4] All cast iron pipe is shipped for sale.

(Concluded on page 250)

FOUNDRY STATISTICS (Concluded from Page 249)



INDEX OF FOUNDRY EQUIPMENT ORDERS

Foundry Trades Only
(Net Orders Closed, New Equipment)

	1953	1954
Jan.	99.6	173.8
Feb.	97.5	....
Mar.	132.2	....
Apr.	111.8	....
May	182.1	....
June	156.4	....
July	158.9	....
Aug.	235.5	....
Sept.	127.7	....
Oct.	87.1	....
Nov.	149.4	....
Dec.	160.8	....

Note: Figures are percentages of the base period 1947-49 taken as 100 per cent (monthly average). This is a new base period. Source: Foundry Equipment Manufacturers Association.

INGOT BRASS & BRONZE

(Shipments in net tons)

	1953	1954
Jan.	24,423	20,661
Feb.	25,429	19,920
Mar.	28,256	.....
Apr.	25,044	.....
May	21,660	.....
June	20,818	.....
July	19,321	.....
Aug.	20,156	.....
Sept.	21,463	.....
Oct.	22,280	.....
Nov.	21,860	.....
Dec.	20,541	.....
Total for year	271,251	.....

ZINC-BASE ALLOY

(Shipments of castings—1000 pounds[1])

	Shipments—Totals	Shipments—For Sale	Unfilled Orders[2]
1951	478,996	324,964	.....
1952[3]	408,353	282,673	.....
1953[3]			
June	49,051	31,255	88,060
July	39,360	25,221	83,034
Aug.	38,214	24,230	77,895
Sept.	38,965	26,403	72,631
Oct.	41,170	28,729	72,967
Nov.	38,032	26,461	69,218
Dec.	38,976	27,664	64,047
Total	523,892	341,963	.....
1954			
Jan.	40,396	27,257	61,745

COKE PRODUCTION & CONSUMPTION

(Net tons)

	Production	Consumption Total	Consumption By Foundries
1951	79,133,744	78,868,124	3,664,404
1952	68,254,109	67,865,639	3,102,446
1953			
Jan.	6,763,494	6,880,195	248,945
Feb.	6,140,075	6,271,311	237,620
Mar.	6,842,488	6,880,579	275,442
Apr.	6,543,601	6,541,307	271,955
May	6,824,810	6,752,823	272,673
June	6,625,223	6,692,864	254,830
July	6,748,229	6,654,080	217,504
Aug.	6,719,941	6,587,005	236,738
Sept.	6,404,143	6,330,441	236,119
Oct.	6,554,638	6,555,613	236,329
Nov.	6,208,155	6,039,813	216,837
Dec.	6,093,009	6,041,383	210,388
Total	78,467,806	78,227,414	2,915,420
1954			
Jan.	5,812,426	5,611,151	224,298

PIG IRON PRODUCTION AND CONSUMPTION

	Production** (Standard grades—1000 net tons) Total	Foundry	Malleable	Basic	Low Phos. Intermediate Low Phos. & Bessemer	Consumption* (By type of furnace, 1000 gross tons) Total	Cupola	Air	Electric
1951	70,264.5	3,186.2	3,169.0	55,134.1	8,774.8	63,760	5,731	354	136
1952	61,306.8	2,864.2	3,013.3	48,254.0	7,174.9	54,911	4,909	269	113
1953									
Jan.	6,470.6	274.9	285.5	5,201.5	708.8	5,784	425	24	12
Feb.	5,802.6	187.0	294.6	4,640.7	680.3	5,027	418	24	14
Mar.	6,601.1	263.9	358.1	5,256.1	723.0	5,873	466	27	14
Apr.	6,161.6	244.7	327.1	4,885.6	704.2	5,568	478	28	12
May	6,508.5	210.0	347.7	5,237.0	713.8	5,844	436	24	14
June	6,288.0	201.6	313.4	5,075.0	698.0	5,581	437	24	12
July	6,425.9	213.5	344.4	5,145.1	722.9	5,580	367	20	15
Aug.	6,381.1	202.1	310.7	5,167.1	701.2	5,672	385	21	14
Sept.	6,121.4	209.4	310.4	4,927.0	674.5	5,379	393	22	16
Oct.	6,409.2	218.9	290.8	5,175.1	724.5	5,733	395	21	13
Nov.	5,995.5	201.0	277.2	4,859.3	658.0	5,325	343	18	16
Dec.	5,713.0	172.3	276.4	4,625.5	638.7	5,092	375	19	13
Total	74,878.5	2,599.3	3,736.3	60,195.0	8,347.9	66,458	4,918	272	165
1954									
Jan.	5,531.1	184.6	294.7	4,510.9	540.9	....	....	....	....

IRON AND STEEL SCRAP CONSUMPTION

(Gross tons*)

	All Scrap Total	All Scrap Purchased	By Types of Furnace: Cupola Total	Cupola Purchased	Air Total	Air Purchased	Electric Total	Electric Purchased
1951	68,518,208	33,822,431	11,090,607	5,878,939	1,203,740	441,099	8,391,919	5,389,005
1952								
Dec.	6,089,722	2,973,633	804,275	412,177	92,621	35,064	758,845	491,084
Total	61,625,549	30,520,946	9,154,146	4,752,497	1,053,233	395,591	8,015,064	5,190,833
1953								
Jan.	6,256,718	3,061,551	810,254	413,971	95,430	35,695	795,292	517,963
Feb.	5,802,854	2,817,896	818,375	422,306	92,371	35,234	745,179	478,486
Mar.	6,536,867	3,211,476	901,786	464,110	103,034	38,583	857,760	563,489
Apr.	6,227,089	3,026,533	921,589	474,185	106,449	41,004	820,647	531,509
May	6,294,920	3,105,598	861,404	450,477	92,703	35,566	798,098	523,606
June	5,951,170	2,835,875	876,320	454,905	99,799	38,934	743,530	468,129
July	5,539,468	2,597,365	729,114	369,283	74,815	26,755	691,521	443,263
Aug.	5,637,759	2,614,153	753,272	390,741	77,047	28,167	678,968	428,332
Sept.	5,395,721	2,393,773	782,131	405,274	80,866	29,032	595,523	363,706
Oct.	5,628,568	.....	779,444	.....	75,618	.....	566,878	.....
Nov.	5,064,585	.....	687,498	.....	60,200	.....	477,666	.....
Dec.	4,690,277	.....	755,276	.....	68,002	.....	442,818	.....
Total	69,005,976	.....	9,676,463	.....	1,026,334	.....	8,263,880	.....

*Source: U. S. Dept. of Interior. Bureau of Mines. **Source: American Iron & Steel Institute. [1]Source: Bureau of the Census. [2]For sale only. [3]Based on new sampling method; not comparable to prior figures.

The Iron Lion Head reproduced in our ad is shown through the courtesy of the Detroit Institute of Arts. It dates from the T'ang Dynasty, A.D. 618-907. We will be glad to furnish a detailed description of this grand old work of art if you write us.

NO self-respecting lion would want his mane marcelled in this fashion, but the artist liked it, so Leo got the new look. Your core room can have a new look too if a strong oil like Linbond is used. Bet on the best and watch that pile of scrap cores disappear. Linbond does it every day. It has all the strength that can be built into a core binder and it offers peak protection for an uncontrolled oven. *Write us for Bulletin No. 6 and see how Linbond compares with Linseed in tests by Dietert.*

The newest member of our Linbond family is a fast baking oil—Linbond FB 72. Are you crowded for more oven capacity? Do you need to get the cores through faster? Well, this is one answer and a sure one, too. You can measure a real saving in baking with Linbond FB 72. *Write us for a chart showing (a) its speed for gaining top strength and (b) the long level time-line over which this strength is sustained. Linbond FB is our new brand for this brand new oil.*

UNITED OIL MFG. COMPANY

1429 WALNUT STREET, ERIE, PA.

The BAKELITE EXHIBIT at This Year's Foundry Show

BAKELITE Phenolic Resins for Shell Molding Featured

Shell molds made with BAKELITE Phenolic Resin BR-12011S will be the feature of the BAKELITE Exhibit at this year's Foundry Show.

You'll be able to see, firsthand, how this resin permits production of shell molds that are finely detailed, smooth, and free from distortion. A wide variety of castings produced in these shell molds will be exhibited. For example,

• Outboard motor parts • Refrigerator pistons • Washing machine parts • Auto clutch plate • Electric motor castings • Pump parts

Other sections of the exhibit will display investment castings made with ZYROX and BAKELITE modified polyester casting waxes, grinding wheels and abrasive products bonded with BAKELITE Phenolic Resins, and pattern plates made from BAKELITE C-8 Epoxy Resins.

If you attend the Show, it will pay you to visit the BAKELITE Exhibit, Space 910. Otherwise, write Dept. XD-29 for further information on these materials.

BAKELITE
TRADE-MARK

PHENOLIC RESINS for Shell Molding

TRADE MARK

BAKELITE COMPANY
A Division of
Union Carbide and Carbon Corporation
UCC
30 East 42nd Street, New York 17, N. Y.
In Canada: Bakelite Company
Division of Union Carbide Canada Limited
Belleville, Ontario

INDUSTRY BRIEFS

WESTINGHOUSE Electric Corp. will break ground in May for construction of its multi-million dollar metals plant at Blairsville, Pa. It is hoped the machinery and equipment will be installed and operating by mid-1955. The plant will provide equipment for basic metalworking processes of melting, forging, hot-rolling, cold-rolling, conditioning, pickling and heat-treating. Facilities for investment casting and shell-mold casting also will be installed.

* * *

Crucible Steel Co. of America has acquired a 50 per cent interest in the Vacuum Metals Corp., Cambridge, Mass., and will concentrate on the development of vacuum melting techniques for steel and metal alloys. Vacuum Metals is a large commercial producer of high purity metals by the vacuum process and was formerly a wholly owned subsidiary of National Research Corp., Cambridge.

* * *

Foxboro Co., Foxboro, Mass., is doubling the size of its Dallas, Tex., facilities with the construction at 11710 East Northwest Highway of a 13,000-sq-ft modern, brick building. The new structure will house the manufacturing, service, repair, warehousing and sales functions. The company manufactures industrial instruments for process measurement and control.

* * *

Joy Mfg. Co., Pittsburgh, has opened a new district sales office at 2410 Terminal Tower Bldg., Cleveland. Howard E. Butters, former district manager in St. Louis, has been appointed new district manager in Cleveland. The new office will provide sales and service to industrial, construction, quarry, metal and nonmetallic operations in Ohio and Michigan.

* * *

Calmo Engineering Co., 1600 Esperanza St., Los Angeles 23, recently completed its 30th year of service to refractory users in California, Arizona and Nevada. The company has developed from a small firm into one

of the largest West coast distributors of quality refractory products. Calmo's operations are devoted exclusively to refractories and related products.

Charles E. Findley has served as president since 1935, with Earl Appleman as vice president. Kenneth Sheckler is chief engineer.

* * *

American Alloys Corp., 805 Waltower Bldg., Kansas City, Mo., has been appointed distributor of Reynolds aluminum pig and ingot. The company will stock aluminum and pig ingot in standard and special analyses.

* * *

J. O. Ross Engineering Corp., 444 Madison Ave., New York, is expanding its operational facilities. Work has been started on a new Los Angeles, Calif., plant. A 25 per cent expansion of the Montreal, Que., plant also is under way. The New York city main office has been enlarged and offices were recently opened in Atlanta, Ga., and Toronto, Ont.

* * *

Michigan Machinery & Equipment Co., 308 Water St., St. Joseph, Mich., has been appointed western Michigan distributor for the Clark Equipment Co., Construction Machinery Division, handling power shovels and tractor shovels. Officers of the new distributorship are A. D. Hoopengardner, president, and B. G. Lindenfeld, secretary and treasurer.

* * *

Greenwich Mfg. Inc., Greenwich, N. Y., suffered an estimated $150,000 loss from fire on Feb. 16. Three buildings of wood and brick construction were destroyed. It is believed that sparks from an adjacent cupola started the fire.

* * *

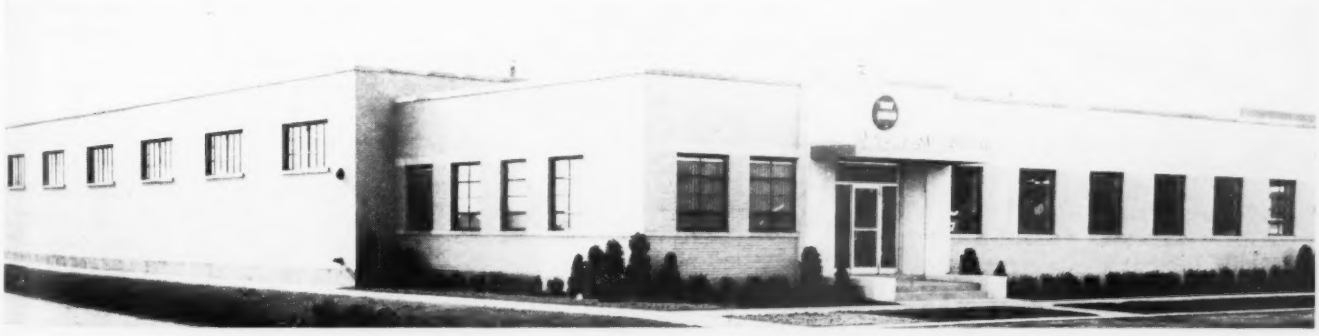
Kwikset Locks Inc., Anaheim, Calif., has expanded its main plant with the opening of a new 35,000-sq-ft building. New die-casting machines and extensive plating and lacquering equipment are included in the new addition.

* * *

Wheland Co., Chattanooga, Tenn., has been granted a building permit of $79,000 for the remodeling and expansion of the core and cleaning rooms of its foundry division.

* * *

Arwood Precision Casting Corp., Brooklyn, N. Y., has signed a 15-year lease for a 27,000-sq-ft office and factory building to be built in Simons



EXPANDS CHICAGO FACILITIES: Bay State Abrasive Products Co., 15 Union St., Westboro, Mass., has expanded its facilities in Chicago with the construction, at a cost of $200,000, of a modern office and warehouse building located at 3701 West 49th St. The enlarged quarters will enable the company to service its Midwest territory better. Stocked will be cut-off, disc and straight snagging wheels, core files, mounted points, cups and cones and surfacing discs, plus other associated artificial abrasive products

Industrial Tract, Vail Ave., East Los Angeles, Calif. New plant will produce ferrous and nonferrous lightweight investment castings primarily for the aircraft industry.

* * *

Dravo Corp., Pittsburgh, has opened a West coast sales office in the Monadnock Bldg., 681 Market St., San Francisco. William A. Walton will be office manager.

* * *

Plant of the Pelron Corp., 7740 W. 47th St., Lyons, Ill., was demolished by fire and a series of explosions on Mar. 22. Damage was estimated at $1 million. The five-year-old plant was engaged in the manufacture of core oils and a variety of other chemical products.

* * *

Martin-Ruegg Brass & Aluminum Foundry, 1620 North Indiana, Los Angeles, has started construction in Gardena, Calif., of a concrete block, single story factory and office building that will house its Die Casting Division. Custom molding and die casting for all types of metal will be done at the new plant.

Castings—ideal for machining—at lower cost

First attach both lead wires to corresponding posts on indicator
Immerse tip about 3 inches in metal
Proper care will insure prolonged service

It's a nuisance to have castings run up costs for molding, cleaning, testing, assembling, partial machining, then have them show up defective under the machining tool! Such costly "rejects" *can* be largely eliminated.

One way is to prevent underheating or overheating of the metals. With a Marshall Enclosed-Tip Thermocouple you can measure temperature of your brass, bronze, aluminum and magnesium, in furnace or ladle. Thus you pour at exactly-right temperature.

Foundrymen everywhere have proven Marshall Thermocouples one of the greatest aids to producing sound, flawless castings, and lowering their production costs. L. H. Marshall Co., 270 W. Lane Ave., Columbus 2, Ohio.

Industry's Safety Color Code Is Modernized

American Standards Association, 70 East 45 St., New York 17, has revised and released to industry a new American Standard Color Code for marking physical hazards and identification of certain equipment for the safety of the man on the job.

In the revised code, three new colors have been added to warn workers against potential dangers. The recently born radiation perils will be announced by high-visibility purple. Orange will be used to designate dangerous parts of machines or energized equipment that may cut, crush, mangle or otherwise injure, and to emphasize dangers from exposed or unguarded parts of machines. Blue will warn employees not to attempt to operate machines while down or under repair.

Still a part of the code are the long-used, nationally accepted: red for fire and danger; yellow for caution and physical hazards; black and white for traffic, dead ends, stairways, directional signs, housekeeping signs; and green for safety equipment.

This revised safety color code may be obtained from the association at 50 cents a copy.

Summer Course To Treat X-Ray Diffraction

Metallurgical Applications of X-ray Diffraction will be the subject of a two-week special summer program to be offered from Aug. 2-13 at the Massachusetts Institute of Technology. The program will provide discussions of the principles of x-ray diffraction illustrated by examples of the practical techniques employed in metallurgical problems. Faculty members of the MIT department of metallurgy will conduct the program with assistance from a number of guest lecturers.

The program is planned to include lectures in the morning and laboratory demonstrations and discussions in the afternoon. The program is not a research conference and the lectures will be directed toward metallurgists who have not had advanced work or who may have been out of school for several years. Elementary knowledge of the nature of x-rays and the structure of metals will be required. Academic credit will not be offered.

Tuition for the course is $180. Additional information and application blanks may be obtained from Summer Session Office, Room 7-103, Massachusetts Institute of Technology, Cambridge 39, Mass.

THERE'S A REASON FOR THE DIFFERENCE!

Maximum metal temperatures with minimum Coke per charge:
Indianapolis Coke structure resists breakage in transit and handling.

Uniform carbon absorption from Indianapolis Coke:
Structure, size and analysis carefully controlled for uniformity.

Flexible cupola operation possible with Indianapolis Coke:
Screened to four distinct size ranges, with narrow top and bottom limits of 1″.
Select the size that fits your cupola operation.

Indianapolis Coke is the standard of comparison and has earned its well-deserved reputation through years of satisfactory performance in large and small foundries everywhere in the United States. *Uniform in size—uniform in quality.*

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CITIZENS GAS AND COKE UTILITY
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INCORPORATED
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BAKER PERKINS SIZE 14

BATCH TYPE UNIDOR CORE AND MOLDING SAND MIXER FOR JOB FOUNDRIES

BAKER PERKINS Unidor Core and Molding Sand Mixers help speed up sand mixing operations and improve the quality of core and mold sand mixes so that you can produce good, clean castings that require less shakeout and machining time. These mixers rub, stir and knead in one operation without special aerating attachments. Gentle and thorough mixing action coats each grain of sand evenly with a thin layer of bond without breaking up the delicate silica grains. The mixed sand has a high degree of permeability, is homogeneous and does not require riddling.

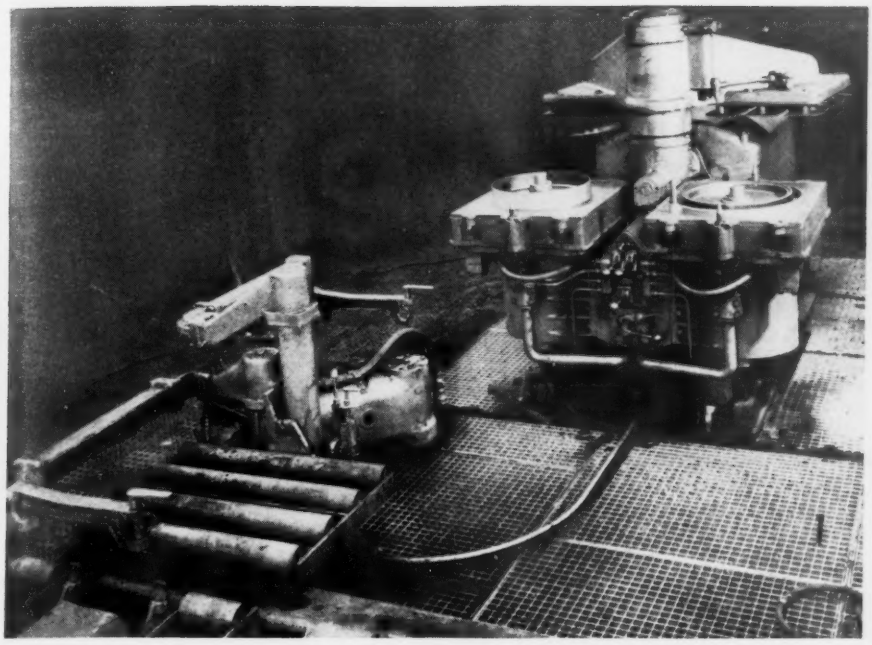
BAKER PERKINS Unidor Sand Mixers are strong and well constructed with a simplified operating mechanism that helps keep maintenance and operating costs low. The No. 14 Mixer shown here has a fabricated steel trough shell and cast iron ends, renewable steel liners, and cast steel Sigma blades with renewable wearing shoes of hardened steel. It has a working capacity of 5.5 cu. ft. BAKER PERKINS Unidor Mixers are available for job foundries in capacities up to 35 cu. ft. These models can be adapted to or equipped with air or electrically operated skip hoists. A laboratory model with a working capacity of 1500 to 2000 grams is also available. For complete information, consult a BAKER PERKINS sales engineer or write us today.

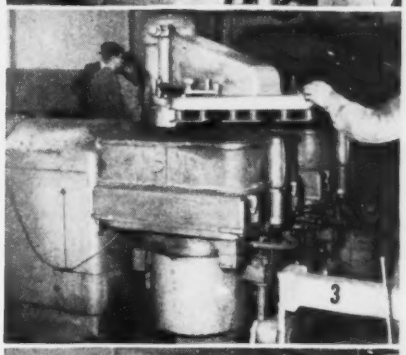
BAKER PERKINS INC.

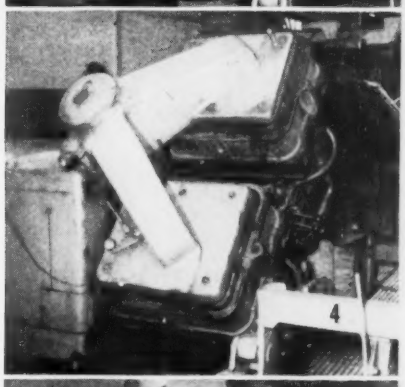
CHEMICAL MACHINERY DIVISION

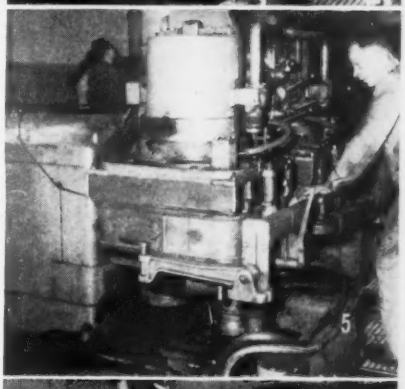
SAGINAW, MICHIGAN

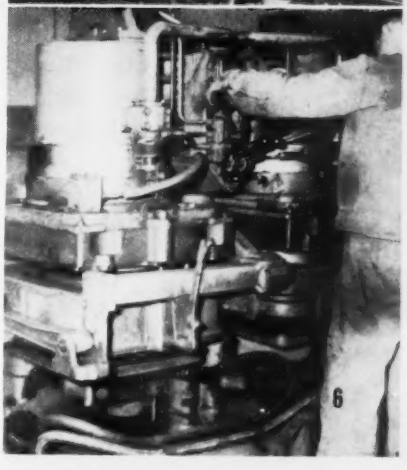
276











TWIN MOLDING MACHINE

Makes Cope and Drag Simultaneously

TWIN molding machine of Swiss design incorporates a flask lifting and closing device and makes both halves of a mold simultaneously.

The lifting and closing device removes the cope and drag from the machine, brings them into any position desired for cutting out gates and risers, inserting cores or for any other operation, then swings the drag over the cope and closes the mold. One man performs the entire operation, which requires about 1 minute.

Each of the two cylinders performs jolting and squeezing operations and can be actuated individually or jointly with the same control handle. Squeeze plates swivel hydraulically through 180 degrees and completely expose the pattern plates so that both facing and backing sand can be fed in without hindrance, either by hand or from the feed hopper. Pattern draw is effected by hydraulic lowering of the squeeze table, a method which has two results—first, squeeze-cylinder stroke is very short, and consequent retention of the long squeeze cylinder guides prevents any tilting. Second, compressed air consumption is reduced.

Cylinders are set on anvils which take the full weight of the machine and practically eliminate jolting vibration. Hydraulic raising and lowering of the cylinders is controlled by light pressure on a foot pedal. Turning of the squeeze arm through 180 degrees is done directly from the hydraulic rotating piston, which has neither stuffing boxes nor packing sleeves. Moving parts work completely in oil.

Speed of draw is controlled by an adjustable stop so that stripping can be done as slowly as desired initially and rapidly thereafter. The lowering draw table can be arrested at any point and, if necesary, raised again. Hydraulic power is produced by a gear pump driven by a direct-coupled motor.

Most pipe connections are in steel tubing, rubber tubing being used only for the short connection from lowering table to vibrator.

The accompanying illustrations, taken in the foundry of Joh. Jakob Reiter & Co., Winterthur, Switzerland, show the operation of the machine. Fig. 1 is a general view.

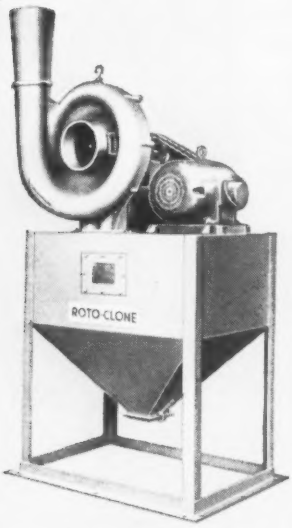
Sand is fed into the two flasks simultaneously by automatic foot control, Fig. 2. The squeeze head is swung out 180 degrees to permit this operation. Governed as to degree and duration by hand-control levers,

(*Concluded on page* 260)

DROP YOUR AIR POLLUTION

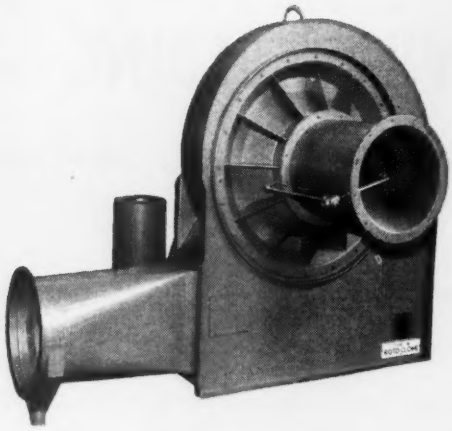
Dust control for snag, swing frame and portable grinding; chipping and abrasive cut-off.

Shakeout dust control from side hoods!



Type D ROTO-CLONE

The lowest cost collector, in the 1,500 to 15,000 cfm capacity range, designed for handling dry, granular dust! This dynamic precipitator combines high efficiency collector, exhauster, motor, drive and dust storage hopper in one compact, easily installed package. Collection efficiency of the Type D remains constant regardless of exhaust volume handled. Quality construction throughout assures long, maintenance-free service. Write for Bulletin No. 272.



Type W ROTO-CLONE

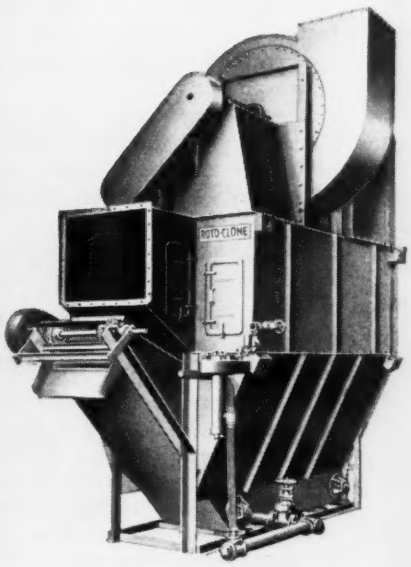
The lowest priced wet dust collector in its class (units of 1,500 to 50,000 cfm capacity designed for high efficiency dust collection). The Type W is a dynamic precipitator which, by adding a moving water film on the collecting surfaces, extends its effectiveness to collection of the finest, lightest particles. Unit is completely shop-assembled—includes collector, exhauster, motor and drive. Write for Bulletin No. 274.

See this equipment—discuss your dust problems at AAF BOOTH 1219, 1954 Foundry Show, Cleveland, May 8-14.

®AAF

PROBLEMS HERE!

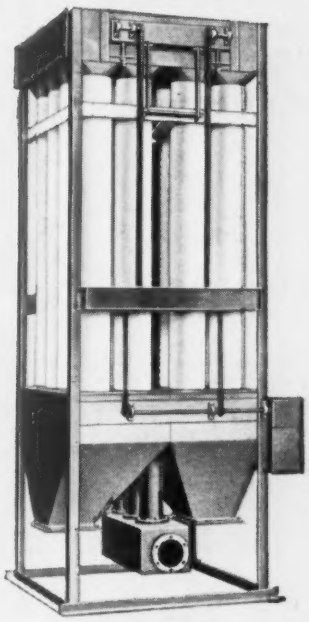
Effective dust control for abrasive cleaning, tumbling mills, sand conditioners and high dust load shakeouts.



New Design 4
Type N ROTO-CLONE

This famous AAF hydro-static dust collector, while retaining the high efficiency cleaning action of its inverted S-shape water curtain, now adds many new features designed to further reduce and simplify maintenance, increase service life and *lower cost*. Addition of 4 larger sizes permits handling of exhaust volumes up to 50,000 cfm. Write for Bulletin No. 277.

Collecting metallic fumes from melting operations where visible smoke in discharge stacks is objectionable.



AMER Jet

A better reverse jet type fabric dust arrester built to exacting AAF design and performance standards, namely—small space requirements; maintained performance over a wide range of operating conditions; constant exhaust volume; high collection efficiency. AMER-jet is available for handling any exhaust volume. Write for Bulletin No. 279.

American Air Filter
COMPANY, INC.
266 Central Avenue, Louisville 8, Kentucky • American Air Filter of Canada, Ltd., Montreal, P. Q.

®AAF

We'll see you at

the show of course:

Booth 108, head-

quarters of Alloy

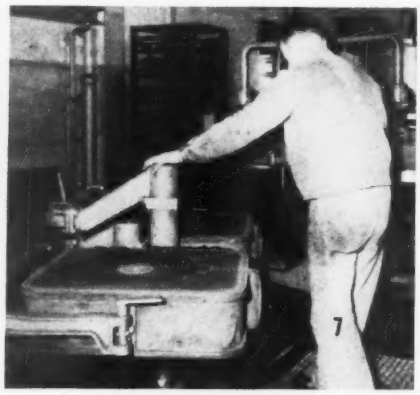
Metal Abrasive Co.,

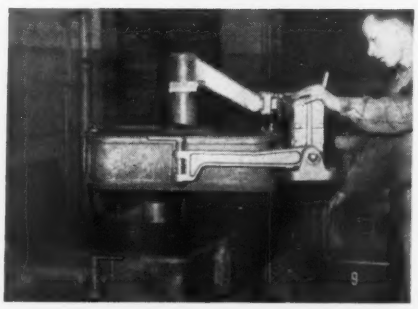
home of "firsts"

(*Concluded from page 257*)

the two cylinders supporting the flasks jolt them by air pressure.

In Fig. 3, the squeeze head has been returned by hand-lever control,





after the jolting, to squeeze the sand in the flasks. Hydraulic oil pressure does this job.

In Fig. 4, hydraulic oil pressure, actuated by electric bushbutton and electromagnetic controls, turns the machine over. Simultaneously, two air vibrators operated by a hand lever vibrate the two pattern plates.

After the molds have been rolled over, the lifting and closing device is swung into position by hand to receive the molds when they are drawn from the pattern, Fig. 5. Fig. 6 shows the molds in the lifting and closing device, which in Fig. 7 has taken them from the machine. At the same time, the machine turns over again, ready to begin another cycle.

Fig 8 shows work on the molds as they are held by the lifting and closing device. The cope half is elevated by a hand-control lever which employs oil pressure, Fig. 8. Cope and drag are being brought together in Fig. 9 and in Fig. 10 the completed mold is being rolled off to a conveyor.

In a more recent development, the mold lifting and closing devise is operated automatically by pushbutton control, instead of by hand as illustrated here. Maximum flask size accommodated is approximately 19 x 24 in. and 12 in. high.

The molding machine and the supplementary mold lifting and closing device are built by Kallnach Machine & Foundry Co. (Maschinenfabrik & Eisengiesserei Kallnach), Berne, Switzerland. They are being used in various European countries.

Depicts Role of Steel

Inland Steel Co., Chicago, has issued a 62-page book, 9 x 12 in., entitled *Steelmen of the Free World* which shows in picture form and text the role of steel in the free nations of the world, and combines lessons in geography, economics, and free government.

Book Review

1953 *Supplement, Book of ASTM Standards, Part* 4, *Paint, Naval Stores, Wood, Fire Tests, Sandwich Constructions, Building Constructions, Wax Polishes,* paper, 161 pages, 6 x 9 in., published by the American Society for Testing Materials, 1916 Race St., Philadelphia 3.

Since publication of the 1952 *Book of ASTM Standards* a number of changes have been made in standards and tentatives, and those are contained in this supplement. Of nine standards included six are replacements of existing standards. Similarly in the case of 21 tentatives presented three are replacements while 16 are published for the first time. The book also contains yellow stickers for affixment in the 1952 volume to direct attention to the various changes in status.

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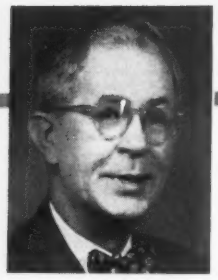


MAN-TO-MAN

By RALPH L. LEE

Getting Ahead—Ahead of What?

"In this race of life, don't spend much time watching the other fellow and trying to get ahead of him. He might be moving too slowly"

HARDLY a week goes by that some young feller (or one not so young) doesn't drop in on me for a heart-to-heart talk about himself and his work, what's eating him, what and who is holding him back and what ought he do about it. This has been going on for many a year, and I've got to admit that I get a certain amount of lift out of knowing that anyone should seek me out for counsel, but at the same time I feel quite a touch of frustration as to what to advise them or just what to do to help them.

All Have Same Troubles

I can hardly think of a trade, craft, profession or activity of any kind which hasn't furnished me with one or more of these inquiring visitors. While they have come in all shapes, sizes and temperaments, the thing that strikes me the most, as I look back over this motley parade, is the similarity of their situations and conversations. Now, this is no recent discovery; in fact, twenty years ago I was asked to speak to a group of college graduates who were not happy at all with the progress they had made since leaving school two or three years before.

I remember that I had never tackled a job with more misgivings; in fact, I tried to back out of it and would have had not my bosses put the screws on me. The talk evidently was helpful, for afterward, much to my surprise, a transcription was published and even to this day pops up every now and then.

Just this past week a young fellow visitor, after telling me his work woes, could hardly believe his ears when I read the following excerpt from that old speech, "Getting Ahead—Ahead of What?" for it was almost a word-for-word repetition of what he had just told me about himself and his situation.

Here's the excerpt I read him:

"Since I'm a friendly sort of person, really like people, and am inclined to take their troubles to heart, I receive calls from many young men who are unhappy with the progress they are making toward the goals they have set for themselves. Their conversations with me are much alike. They run along something on this order—'You know, Doc, I have been over there now about two years and I've learned about everything I can, have gone just about as far as I can go. The only job I really would be interested in is held by a very healthy boss, and I have reasons to believe that he is not particularly fond of me. Confidentially, I think he's just a little bit jealous of my ability, or, let's say, he's not particularly interested in my future. You see, Doc Lee, I'm a fellow who is determined to get ahead. So I'd like to get into something that has a future in it. I know what I can do if I ever get the chance.'"

I have to blush when I tell you that I couldn't stop quoting myself to the young man, any more than I can stop now from quoting to young foundrymen who chance to be reading this issue of FOUNDRY and among whom I'm sure are those wrestling with the same situations as my visitor. So I go on—

You see, those who have cut out for themselves as their major objectives in life that of getting themselves ahead of their jobs and associates, are apt to weigh the value of each job given them to do in the light of its ability to get them on their way, and then, having established the importance of that particular job, they proceed to apply only that portion of their talents and ability they think that job deserves.

In the meantime, one of these ordinary, untalented individuals who thanks God daily for the job he's got, is proud of it and wants to keep it, takes hold of each task assigned as though his whole future depends upon how he does this particular job. Consequently, he does not spare himself, but knowing that his talents and abilities are limited, he puts everything he's got into that job.

Relieved of the necessity of weighing the personal value of each task assigned, and gaining the time such an analysis would consume, he, in spite of his handicap, is able to turn out a job almost equal to his talented and personally ambitious associate, who has performed his tasks with one hand tied behind him, so to speak.

As time goes on, the talented and personally ambitious fellow makes a few bum guesses as to the importance of the jobs he gets, holds out on his talents to a point where his finished jobs are no longer satisfactory, and then begins to suspect that his boss is losing interest in him and showing favoritism to the other fellow.

Here, my friends, appears the first indication of the bane of all abnormally ambitious people—a consciousness of internal politics, cliques and favoritism.

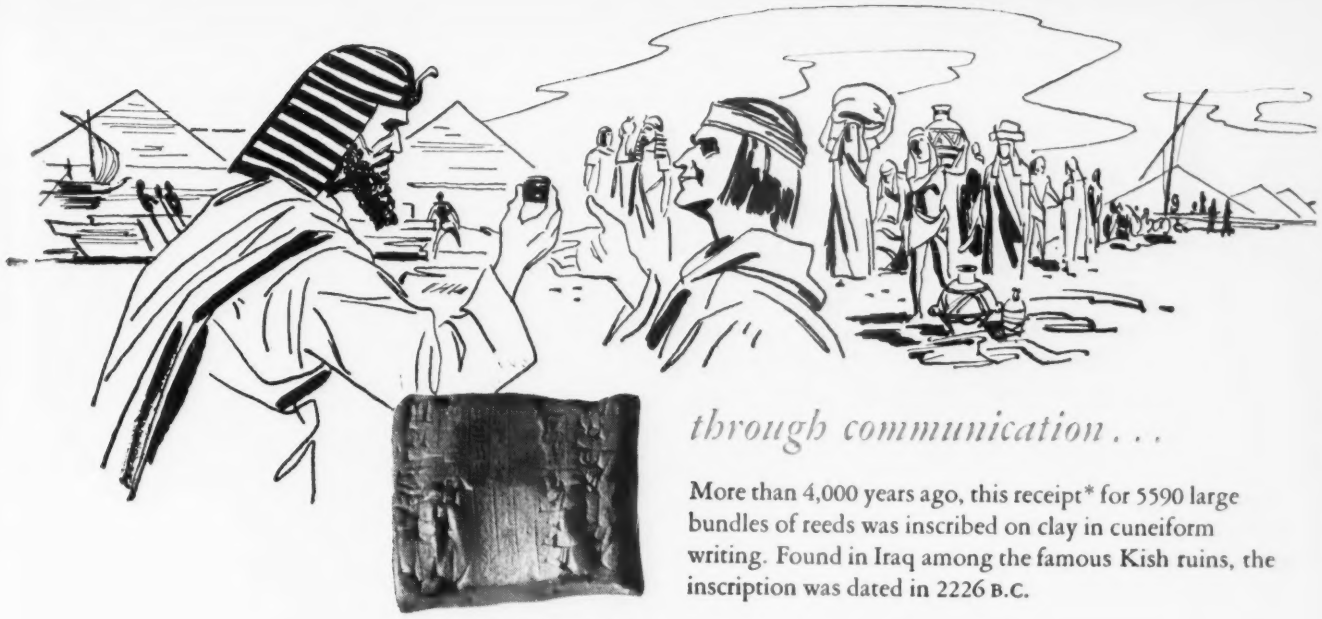
Sure Sign of Slipping

I would like to tip you off to something which could take twenty years to learn for yourselves. Whenever you become conscious of politics and personal jealousies interfering with your progress—watch out! For this is one of the surest signs I know you are slipping; you are beginning to slip and blaming it onto other people.

Unfortunately, the boss usually has so many things to do and such little time to do them in, that he cannot stop and explain—from his standpoint or the company's—the relative importance of each job he assigns. And since his major interest cannot be what his employees want to become, except in the bearing that desire has on helping him or the company get its work done, our overly ambitious friend is likely to miscalculate in applying his talents and fail to turn out satisfactory work. As a consequence, he feels that he is being picked upon personally and the untalented plodder is favored.

In my short span of busy years I have seen this drama enacted over and over again. I have seen men who, by virtue of their God-given talents, should have been shouldering the more important responsibilities

(*Concluded on page* 264)



through communication . . .

More than 4,000 years ago, this receipt* for 5590 large bundles of reeds was inscribed on clay in cuneiform writing. Found in Iraq among the famous Kish ruins, the inscription was dated in 2226 B.C.

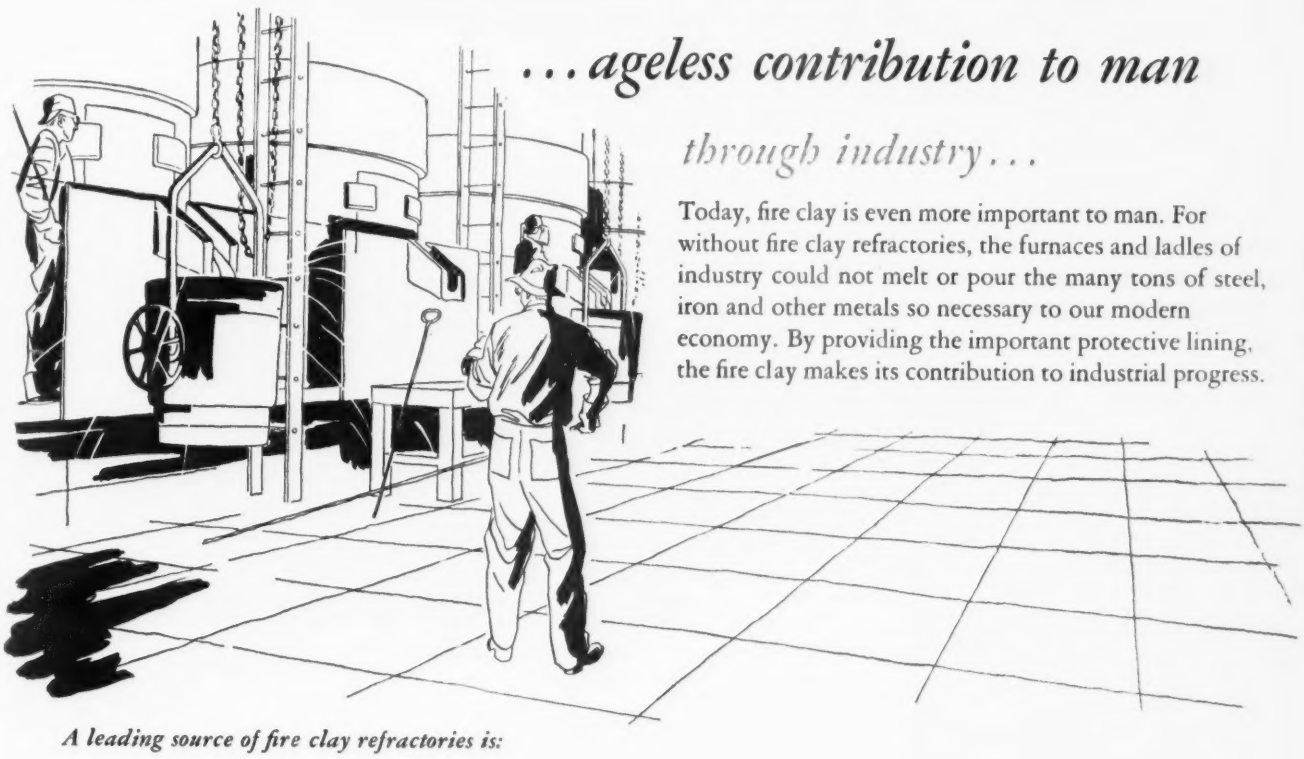
*Courtesy of Chicago Natural History Museum

FIRE CLAY

. . . ageless contribution to man

through industry . . .

Today, fire clay is even more important to man. For without fire clay refractories, the furnaces and ladles of industry could not melt or pour the many tons of steel, iron and other metals so necessary to our modern economy. By providing the important protective lining, the fire clay makes its contribution to industrial progress.



A leading source of fire clay refractories is:

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Sales Office: 208 S. La Salle Street, Chicago, Illinois
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MANUFACTURERS OF GOOSE LAKE AND CHEM-BRIX REFRACTORIES AND THERM-O-FLAKE INSULATION

(*Concluded from page 262*)

of an organization, become more and more discouraged, disgruntled and then, pitying themselves, give up the ghost and move on from place to place in a futile effort to find *the* job that holds a future in it for them.

If I'm not careful I'm afraid I will give you the impression that I approve of drifting through life and permitting conditions and circumstances to dictate our course. I certainly do not want to do this, for I know that nothing that ever amounted to a whoop was accomplished except through teeth-gritting determination to overcome obstacles.

Neither am I depreciating the vital importance of special education and special training along definite lines and the continued need, long after school, for study and practice—all of which, of course, calls for some preconceived idea of the direction in which we wish to go. But even though I do feel that choice of direction is important, many people waste valuable time trying to predetermine the distance they intend to go in that direction—with little success.

Even though you may not agree with me, I for one am not going to spend much of the time I have left trying to establish the point I intend to reach in the future; I shall not try to predetermine the height of my attainments.

I give you two reasons for this decision: (1) I may be capable of going much farther than any goal I may set now; (2) I may live a life of bitter disappointment in failing to reach a goal I had no right to set for myself.

I shall apply the time and effort I might otherwise spend in checking my progress toward a goal, to the job I am doing right now—writing this little article for you. I shall do this job as though it were the most important job on earth—and my last job on earth.

If I follow this rule or philosophy, I know from my own experience and the experience of others that the resulting work will be good work, that credit for it will accrue to my interest, that my reputation for doing good work will come to the attention of those in a position to show their appreciation, and the chances are ten to one that I shall awake some day to the realization that I am much farther down the road than I had any idea of being.

I know that the best jobs were not secured through seeking, for good jobs have a way of seeking men—those who have left a trail of satisfactorily completed jobs behind them.

I close with this friendly and sincere suggestion. In this race of life, don't spend much time watching the other fellow and trying to get ahead of him. He may be moving too slowly. Make the race between the poorer and better self that are in all of us. Let us make the race between that which is possible for us to do under the circumstances and what we actually do. If we do this, and it's a real big contract, failure is impossible.

Book Review

1953 *Supplement, Book of ASTM Standards, Part 7, Textiles, Soap, Water, Paper, Adhesives, Shipping Containers,* paper, 294 pages, 6 x 9 in., published by the American Society for Testing Materials, 1916 Race St., Philadelphia 3.

This volume presents extensively revised standards and new and revised tentatives which have been accepted by the society since appearance of the 1952 *Book of ASTM Standards.* These include seven standards, of which five are replacements and 39 tentatives; 12 are replacements while 26 are published for the first time.

Pouring the water-cooled electrode holder shown in the picture below at City Pattern Foundry and Machine Co.

Cleaning a water-cooled electrode holder to smooth out parting lines, gate and riser contacts, etc.

A typical foundry specializing in beryllium copper

City Pattern Foundry and Machine Co., of Detroit, started operations 41 years ago with three men in a 20′ x 30′ room. Today it employs 300 men in a plant area of 50,000 square feet, and can provide a complete service from blueprint to machined castings ready for assembly. Most of the Berylco castings City Pattern produces are of high-conductivity, high-strength beryllium copper alloys for various resistance welding applications. Many welding jaws, resistance welding dies, and electrode holders are now being cast in Berylco, particularly where size and shape requirements—as in the holder shown on the left—prevent the economic use of wrought materials. Berylco resists heat checking, mushrooming and sticking. Its added hardness, as compared with other alloys, gives better service under the high pressures met in welding materials like stainless steel.

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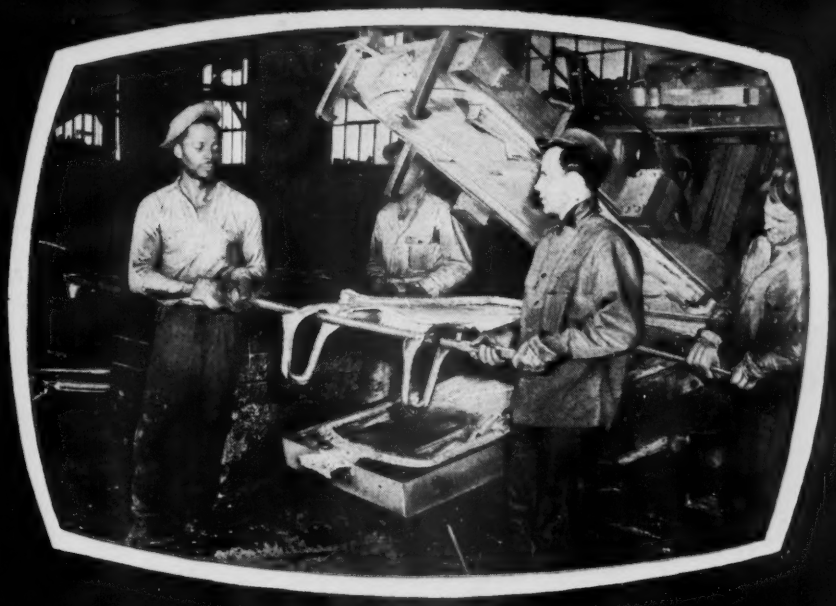

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3026 SUBSIDIARY OF AMERICAN-MARIETTA COMPANY

OBITUARY

W S. ROBINSON of Benton Harbor, Mich., a director of Muncie Malleable Foundry Co., Muncie, Ind., died Mar. 24. Associated with the malleable iron industry for 67 years, in 1919 Mr. Robinson was one of a group which acquired the Whiteley Malleable Iron Co., Muncie, and the name was changed to Muncie Malleable Foundry Co. He was made its vice president in 1947. Previously he had been connected with Whiteley Malleable Iron Co., Brady Foundry Co., Chicago, and Benton Harbor Malleable Foundry Co., Benton Harbor, Mich.

* * *

Ralph Ditty, 77, president, Federal Foundry Supply Co., Cleveland, died there Mar. 16. Mr. Ditty helped

RALPH DITTY

organize the company in 1907 and since 1919 had been its president and executive management head. His son, Elmer Ditty, is its secretary.

* * *

Martin J. Anderson, recently appointed director of engineering research, Mathews Conveyer Co., Ellwood City, Pa., died Mar. 9, at Mt. Dora, Fla. Mr. Anderson was chief engineer for the company formerly.

* * *

Herbert R. Replogle, 66, until his retirement two years ago real estate supervisor and a director, Warren Foundry & Pipe Corp., Phillipsburg, N. J., died Mar. 11.

* * *

Herman H. Walther, 57, chief metallurgist and a director, Dayton Steel Foundry Corp., Dayton, O., died Mar. 14.

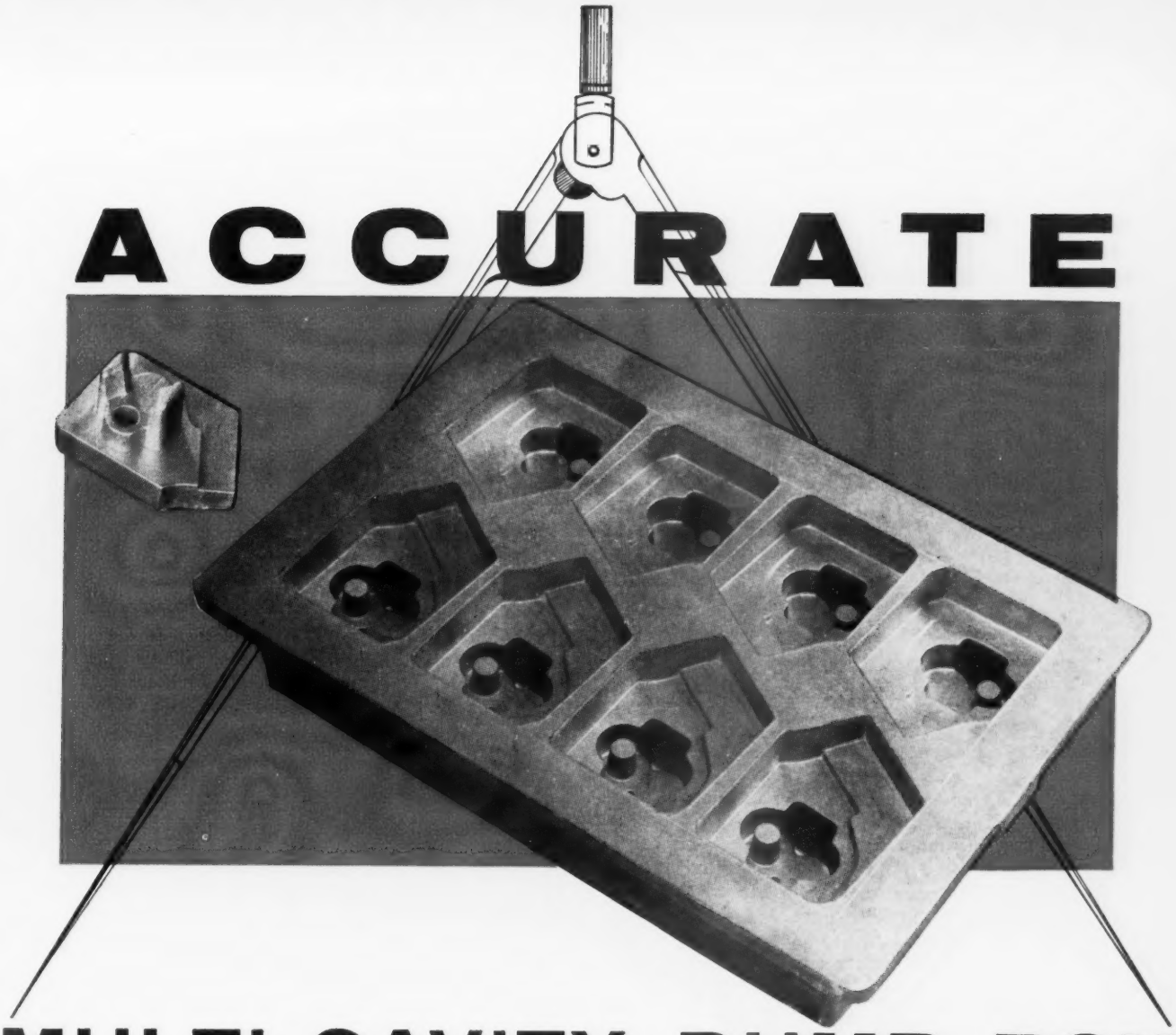
* * *

Guy M. Polhemus, 60, owner of Central New York Foundries Inc., Manlius, N. Y., died Feb. 27.

* * *

George Kramer, sales manager, Lakey Foundry Corp., Muskegon, Mich., died Mar. 1.

ACCURATE



MULTI-CAVITY DUMP BOX

UNIFORM IMPRESSIONS... LOWER COST

The 8 gang dump box shown in this unretouched photograph was made from the single wood master core plug and backing frame. The same method may be used for two part split or booked type core boxes with flat or irregular partings. Added savings plus greater accuracy are assured when properly cleared white metal or aluminum master dryer patterns are also made by this same process.

There is real profit in this idea for you. Hundreds of foundries are now using this modern streamlined method of making core boxes and master dryer patterns because it is accurate, saves machining and offers large savings in the more intricate and gang type core boxes.

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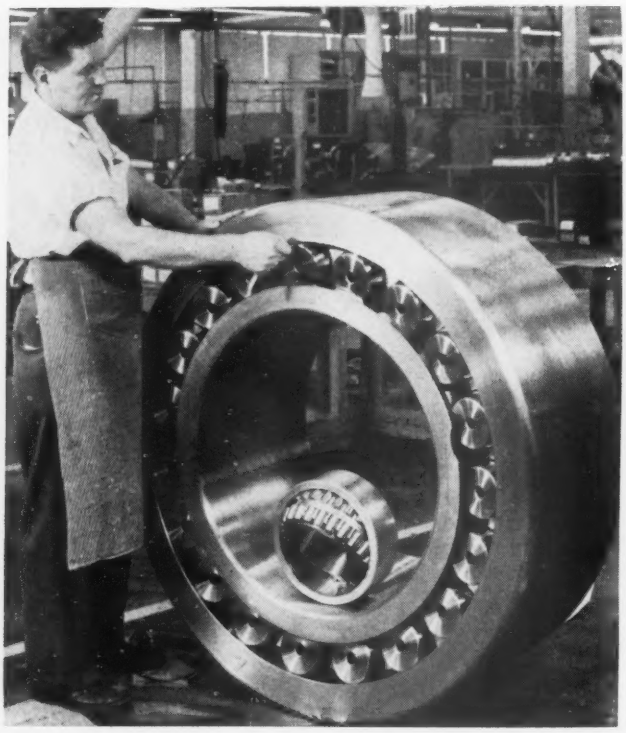
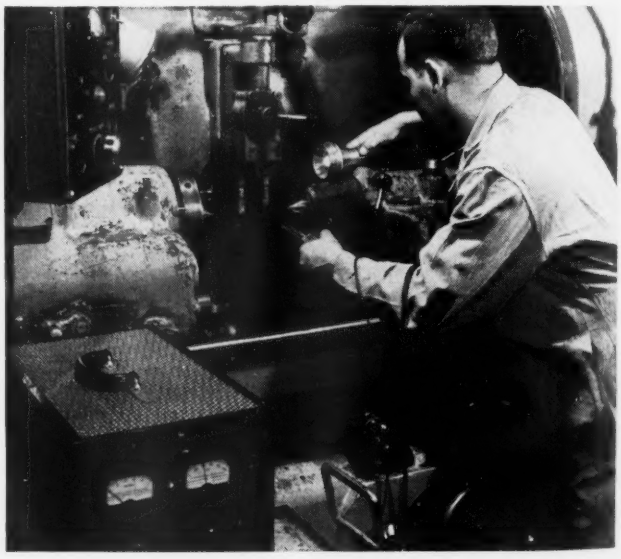
NEWS VIEWS

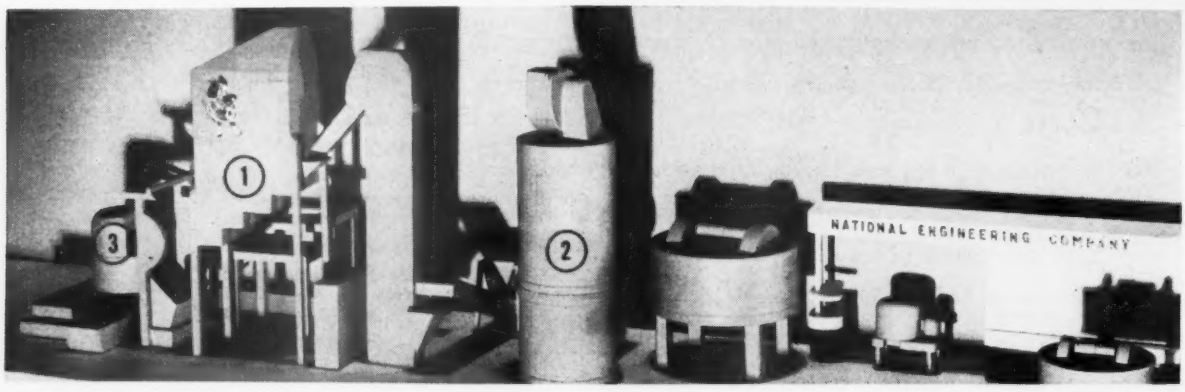


GIANT BEARING: Small spherical roller bearing is compared with mammoth bearing for a tube reducing machine that will take ingoing tubes to 18 in. OD. Rated capacity of the bearing is 3,200,000 lb and is the largest manufactured by SKF Industries Inc. for use by the Tube Reducing Corp. in a $10½ million naval industrial installation at Wallington, N. J. The new facility will produce precision tubing in sizes from 9 to 17 in. OD

FOUNDRY EDUCATION: At recent Foundry Educational Foundation College-Industry Conference at Cleveland, Dr. J. T. Retalliata, left, president, Illinois Institute of Technology, chats with Dr. J. T. MacKenzie, American Cast Iron Pipe Co., Birmingham, retiring FEF president.

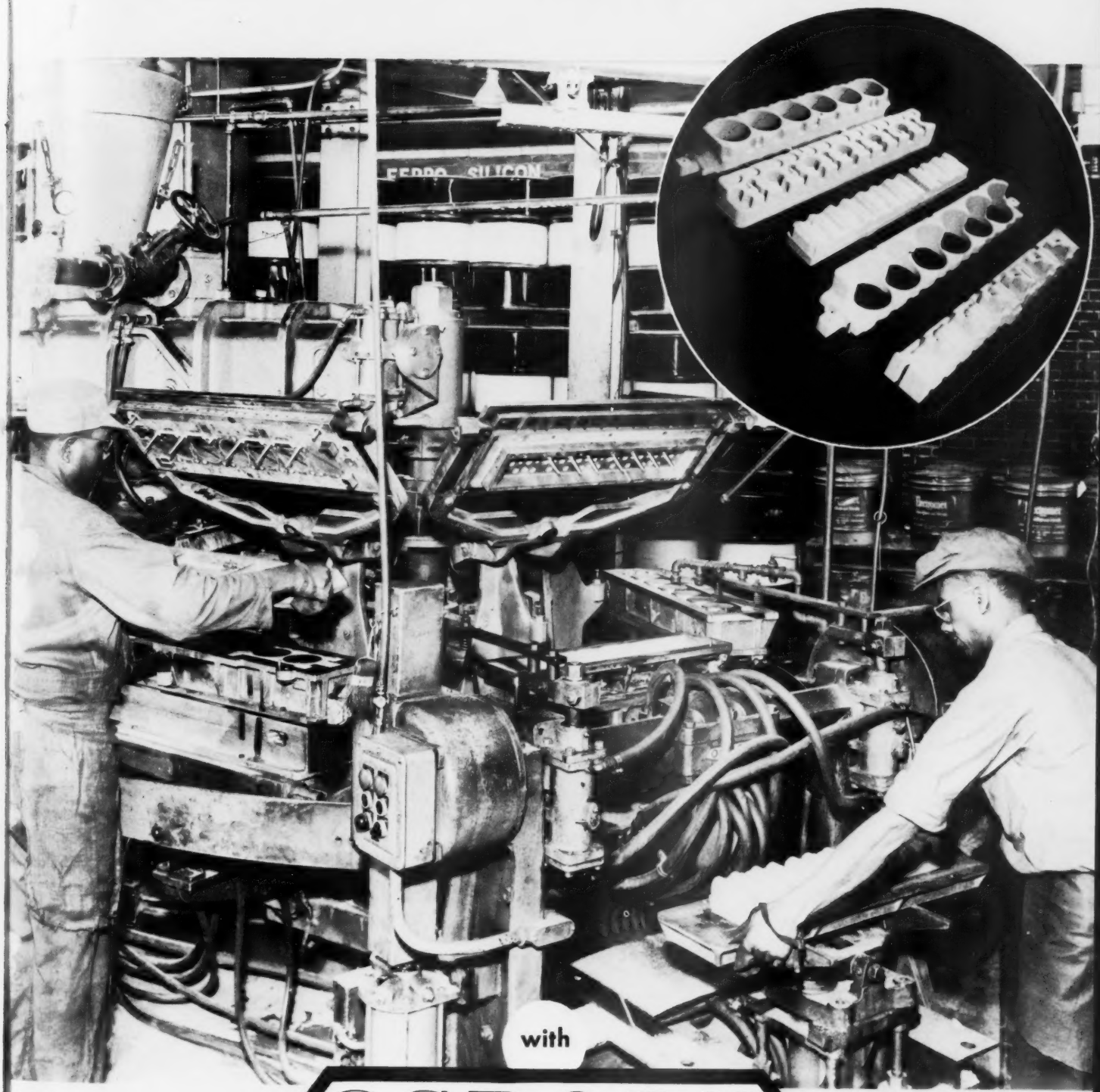


VIBRATION DETECTOR: Abnormal vibrations in rotating machines can be located without dismantling the machine by using a special Timken Roller Bearing Co. instrument, which consists of a vibration pickup, filtering probe, stroboscopic lamp and an electronic device that records frequency and amplitude of vibration. Timken, in its grinding machine maintenance program, has maintained an average vibration level of ninety millionths of an inch



SAND RECLAMATION: Visitors to the AFS Foundry Show in Cleveland will see actual units, shown here by models, of the National Engineering Co. reclaim, rebond and return for reuse waste core sand. Equipment will include (1) sand recovery unit, (2) Hydro-Filter to remove waste fines as wet sludge and (3) mix-muller to rebond sand

CUTTING CORE COSTS



ROTO-CORE AUTOMATIC

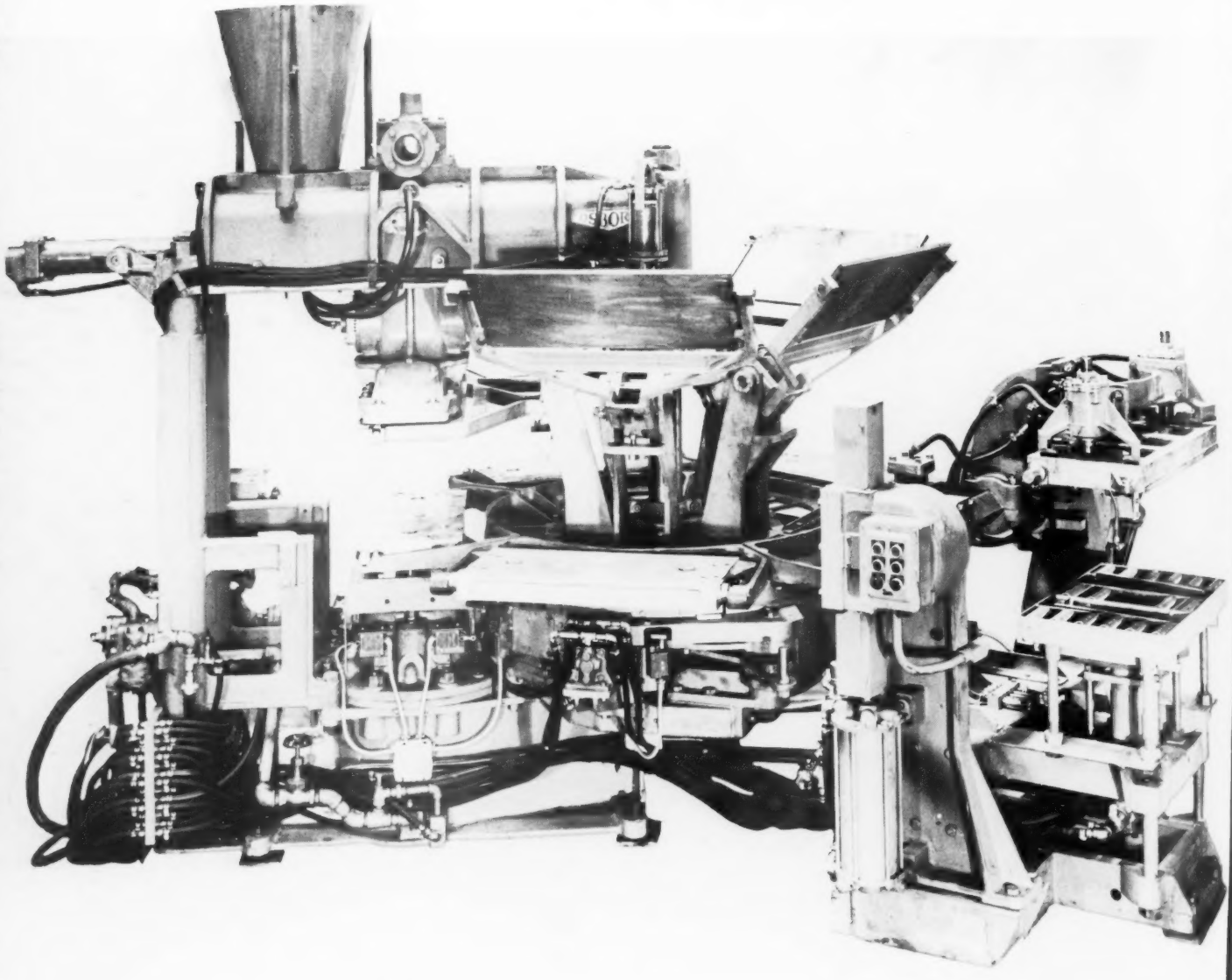
Core Production Unit

THE OSBORN MANUFACTURING COMPANY

Cleveland 14, Ohio

WHY OSBORN'S ROTO-CORE CUTS CORE COSTS

This Automatic OSBORN Core Production Unit blows 5 different core boxes or 5 duplicate core boxes simultaneously. Many installations of OSBORN Roto-Core Production Units have yielded cost savings of 60% or more and are operating at rates exceeding 360 blown core boxes per hour.



See the OSBORN ROTO-CORE AUTOMATIC at the Foundry Show Booth 1115

The Osborn Roto-Core Automatic is a versatile machine combining the functions of three units . . . Core Blower, Five Station Turntable and Rock-over Draw Machine . . . into one fully automatic core blowing machine.

Accepted Standard

The Osborn Roto-Core method for blowing cores has become standard procedure in many foundries for economically producing long-run as well as short-run core production. Result . . . high quality cores consistently produced.

Continuous Operation

Roto-Core operates on a preset time cycle. It is stopped only when necessary to change a setup. Most jobs require the use of only two men. One man positions a dryer plate over the blown core preparatory to rocking over, the other removes the blown core. Core box is automatically cleaned and sprayed at make-ready station where core wires can be set if required.

Versatile

The standard Osborn Roto-Core machine is furnished with or without the Cope Handler, depending upon production requirements. When blowing five different cores on the machine, the Cope Handler is used to carry and position over each box a separate sub-blow plate. Each plate contains blow holes of proper size and position to suit its individual core box.

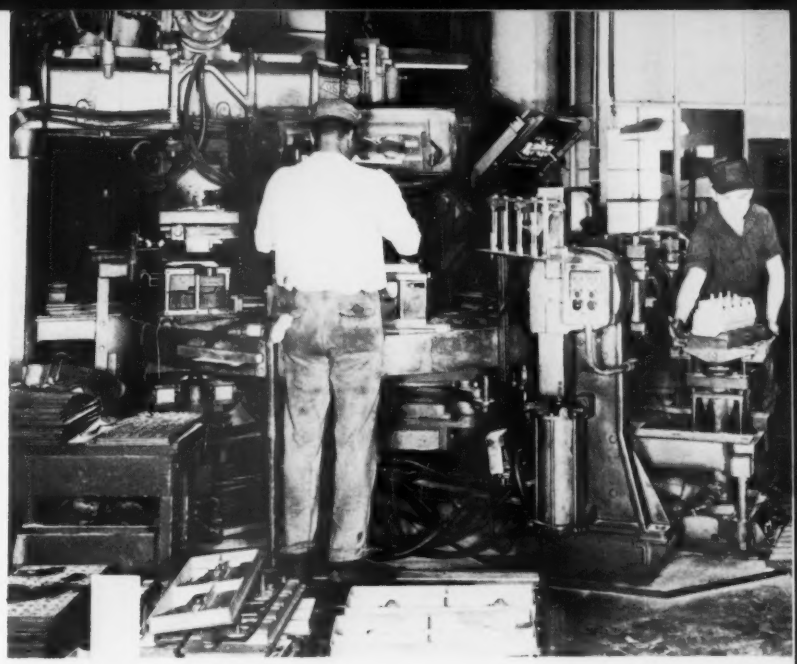
Easy to Set Up

The Roto-Core can accommodate a wide range of core box sizes. In many cases, existing core box equipment can be used. With an interchangeable floating platen design, core boxes can be changed over in less than three minutes, enabling the machine to operate with a minimum of change-over time.

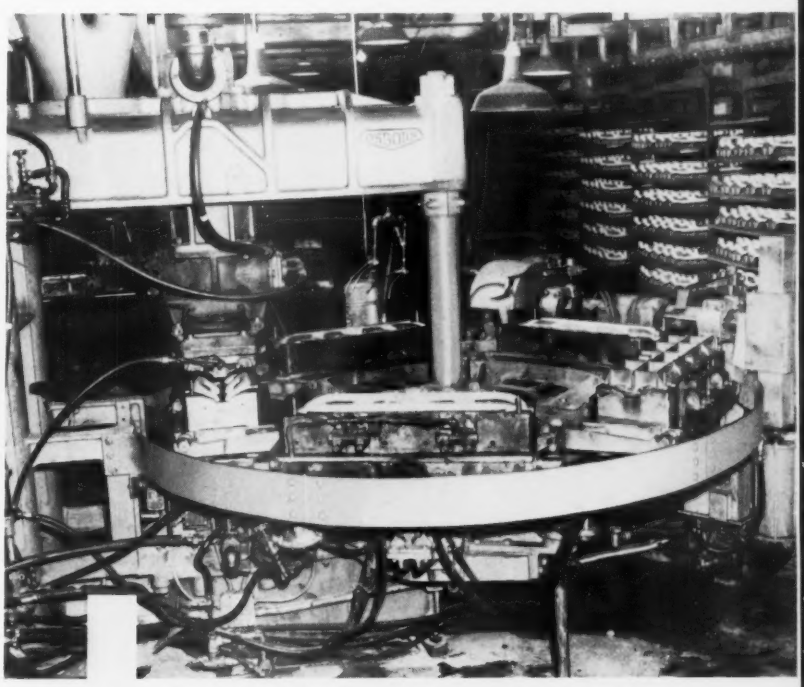
Details on the Roto-Core Automatic are available through your factory-trained Osborn representative or by writing: *The Osborn Manufacturing Company, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

THE OSBORN
MANUFACTURING COMPANY
5401 Hamilton Ave.
Cleveland 14, Ohio

OSBORN
MOLDING MACHINES CORE BLOWERS



Producing Five Different Cores at one time. Roto-Core Automatic is equipped with Cope Handler. One man positions dryer plates . . . other man removes finished blown cores. Machine operates on preset time cycle.



Five Duplicate Core Boxes are produced simultaneously by Osborn Roto-Core Automatic. For work of this kind, Cope Handler is not used. Each core box above yields two manifold cores.

Another example of
Osborn leadership
and advanced engineering

See Roto-Core in action

"CUTTING CORE COSTS"

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16mm black and white with sound.

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Proposed Tentative Methods of
Chill Testing of Cast Iron

ASTM Designation: A 367—53T

Issued, 1953

Scope

1. These methods of chill testing apply to gray irons which are to be free of chill in the casting and to chilled irons which are to have a specified depth of chill in the casting. Two methods of determining the chilling tendencies of cast iron are covered as follows. For many applications either method will be satisfactory if test pieces of the proper dimensions are selected.

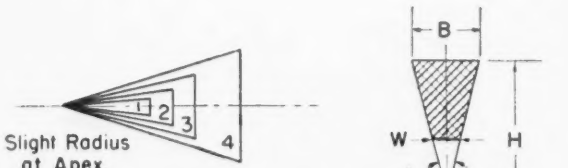
Method A. Wedge Test—This test is generally better adapted to the higher strength gray irons. The accelerated cooling rate to induce the formation of a chill is brought about through the design of the test specimen. This method is simpler than method B since maintenance of chill blocks or plates is not necessary.

Method B. Chill Test—This test is better adapted to the softer grades of gray iron and should be used if the casting is to have a specified depth of chill. The chill in this type of test is induced by casting one edge of the test specimen against a metal or graphite chilled plate or block.

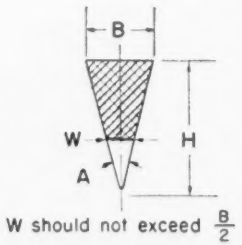
METHOD A. WEDGE TEST

Application

2. Selection of a test specimen of appropriate dimensions will allow measurement of chilling tendencies of all gray iron compositions, with the exception of those having silicon contents much over 2.50 per cent together with carbon contents over 3.50 per cent.



Cross-Section of 4 Wedges



W should not exceed $\frac{B}{2}$

	Wedge Dimensions			
Wedge No.	B, in.	H, in.	A, deg.	Length, in.
W 1	0.20	1.00	11.5	4
W 2	0.40	1.25	18	4
W 3	0.75	1.50	28	4
W 4	1.25	2.00	34.5	6

Fig. 1—Dimensions for test wedges for method A

Test Specimens

3. The patterns for the test specimens shall be made of metal to the dimensions shown in Fig. 1. With the exception of the length of the test specimen, dimensions shall not vary more than plus or minus $\frac{1}{32}$ in. The tolerance on the length of the specimen shall be plus or minus $\frac{1}{8}$-in. The radius on the apex of the wedge should be formed by filling a $\frac{1}{32}$-in. flat on the sharp edge of the metal pattern and then carefully rounding the edges formed by the $\frac{1}{32}$-in. flat and the sides of the wedge. If draft on the pattern is desired, it may be obtained by varying dimension H (Fig. 1) from one end of the specimen to the other. The pattern should be mounted in a core box so that the final core can be poured with the wedge in such a position that its length is vertical. There shall be 1-in. minimum sand at the bottom of the core.

Test Procedure

4. (a) Cores—The test shall be made in a core. The cores may be either single cores or gang cores. If a gang core is used, the minimum amount of sand between adjacent test specimens shall be not less than 2½ x B (Fig. 1). The sand cores shall be well baked and may be either resin or oil bonded. The base sand shall be of such fineness that a smooth casting will be obtained. A sand with an AFS fineness of about 70 will be found satisfactory, although a sand with a fineness of 100 or finer may be used for the smaller test specimens.

(b) Pouring Practice—The test specimens should be poured at a fairly uniform temperature. Precautions should be taken to obtain a representative sample of iron for the test specimen. Best results are obtained with a sample ladle lined with a refractory mixture which is free of graphite and chilled iron. The ladle should hold at least 5 lb of iron in order to avoid excessive chilling of the iron before the test specimen can be poured. Filling the ladle once with iron just prior to obtaining the sample for test is recommended.

(c) Cooling of Test Specimen—If time is an important factor in control applications, the test specimen may be quenched in water as soon as it is completely solid. The quenching must be done carefully to avoid cracking of the chilled apex of the wedge. This may be accomplished by grasping the wedge with tongs at the apex of the wedge and immersing about ¼ to ½-in. of the base of the wedge in water. The wedge may then be gradually quenched but should be removed while there is still sufficient heat in the wedge to dry off the water. If speed of testing is not important, the test specimen may be either cooled in the core or in the air. If cooled to a very dull red before quenching in water, the demarcation between the chilled iron and the gray iron is somewhat clearer than if the test specimen is quenched as soon as it is solid.

Measurement of Chill

5. The test specimen shall be broken by striking with a hammer in such a manner that the fracture is straight and midway of its length. The chill shall be expressed in terms of $\frac{1}{32}$ in. as measured across the wedge at the junction of the white iron and the gray iron. The location of the measurement is illustrated in Fig. 1. In reporting the chill measurement, the size of test specimen shall be designated. A chill reported as W3-12 would indicate that wedge W3 was used and the width at the junction of the chilled and gray portions of the fracture was 12/32 in.

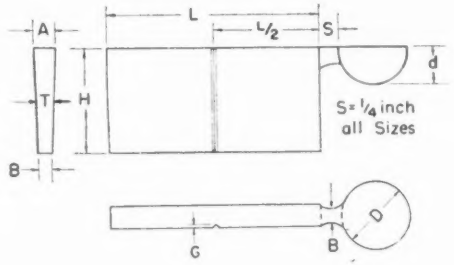
METHOD B. CHILL TEST

Application

6. This method is better adapted than method A to irons having silicon contents of 2.50 per cent and over and carbon contents of 3.50 per cent and over. It is also useful for control purposes in high production foundries making irons somewhat lower in carbon and silicon than indicated above. This method is also preferable for applications in which the casting is to have a specified depth of chill.

Test Specimens

7. The patterns shall be made of metal and conform to the dimensions shown in Fig. 2. All dimensions shall be within plus or minus $\frac{1}{32}$-in. of those shown, with the exception of the length which may vary plus or minus $\frac{1}{8}$ in. The test specimens shown are designated to be cast in the position shown. This design is the preferred one although for high production work a gang core box and pattern may be used. In this case a test specimen with the chilled face in a vertical position may be found more convenient although it is not considered as satisfactory as the horizontally cast test specimen.



Chill Test No.	Recommended Dimensions, in.								Recommended Chill Depth Range, $\frac{1}{32}$ in.[a]
	T	A	B	H	L	D	d	G	
1C	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{1}{8}$	$1\frac{1}{4}$	$2\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{32}$	3 to 12
2C	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{5}{16}$	$1\frac{1}{2}$	3	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{3}{32}$	4 to 16
3C	$\frac{5}{16}$	$\frac{7}{16}$	$\frac{7}{16}$	$1\frac{3}{4}$	$3\frac{1}{2}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{1}{16}$	6 to 24
4C	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{9}{16}$	2	4	1	$\frac{5}{8}$	$\frac{1}{16}$	8 to 32
5C	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{13}{16}$	$2\frac{1}{2}$	5	1	$\frac{5}{8}$	$\frac{3}{32}$	12 to 48

[a] T/2 to 2T.

NOTE 1.—Casting to be made in a dry sand core.
NOTE 2.—Allow ¾ in. of sand on all sides.

Fig. 2—Recommended dimensions for method B chill test specimen

Test Procedure

8. (a) Cores—The test shall be made in a core. For general application, a single core is considered more satisfactory than a gang core. If a gang core is used, the amount of sand between test specimens shall be 1 in. minimum or 2½ x A (Fig. 2), whichever is greater. The remarks concerning cores in Section 4(a) apply here also.

(b) Chill Plates—Chill plates may be cast iron, steel, copper, or graphite. The surface of the chill plate shall be machined. When single test specimens are cast, the chill plate shall extend at least 1 in. beyond the test specimens in all directions and shall be at least 1-in. thick. For high production work, a sufficient number of chill plates must be available to keep the temperature of the plate below 500° F. A water-cooled steel plate will be found more satisfactory for high production work. A water-cooled plate having a reservoir is preferable to one having circulating water. In the latter case the plate may become too cold, resulting in condensation of moisture on the plate. The chill plate must be kept free of fire cracks and all foreign matter as the depth of chill is markedly affected by the presence of films of burned oil or other accumulations. The best practice is to clean off the plate with a wire brush as soon as the core and test specimen is removed.

(c) Pouring Practice—Remarks on pouring practice in Section 4(b) apply here. In addition, iron shall not be poured directly on the chill plate as the depth of chill may be affected or the test specimen may burn on the chill plate. It may be desirable to place a weight on the core when pouring it as there may be a tendency for the core to lift as it is being poured. The opening in the core shall be free of sand fins and shall set flat on the chill plate. In the event the core does not fit the chill plate, it shall be rubbed until it does.

(d) Cooling of Test Piece—The remarks in Section 4(e) apply here. If rapid testing is desired, the chill test specimen may be quenched in water, starting with the edge farthest from the chilled edge.

Measurement of Chill

9. The test specimen shall be broken in such a manner that the fracture is straight and follows the notch in the test specimen. The chill shall be measured from the chilled face to the junction of the white iron and gray iron portions of the fracture. In the case of a broad mottled zone, it may be necessary to indicate whether the measurement is "clear chill" or includes part of the mottled zone. The depth of chill shall be expressed in terms of $\frac{1}{32}$ in. and the size of test specimen used shall be designated. For example, a measurement recorded as 4C-12 indicates that test specimen design 4C was used and the depth of chill was 12/32 in.

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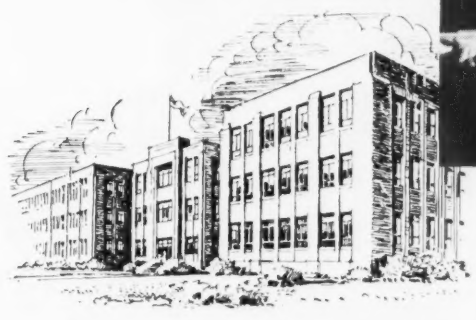

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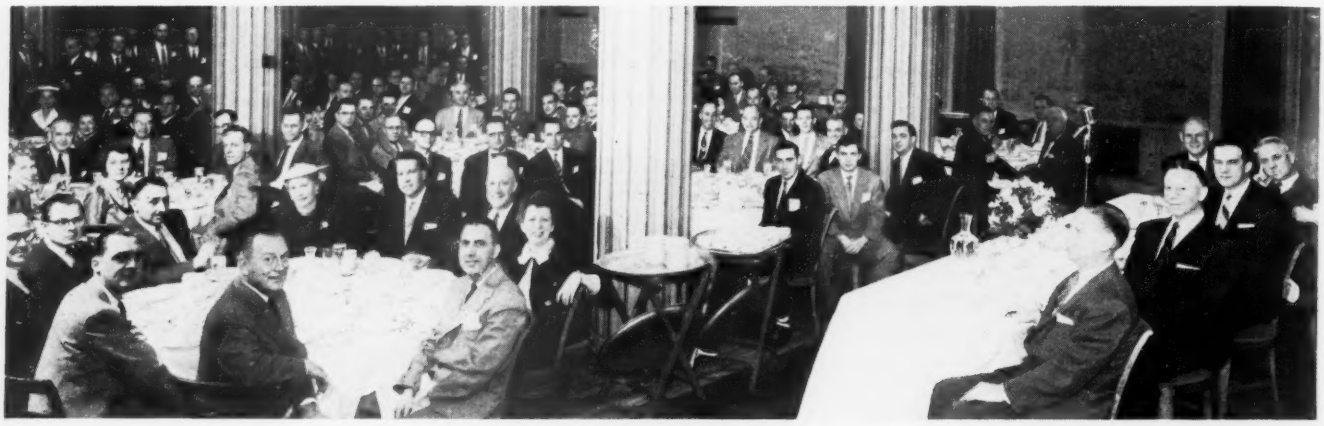


View of dinner held during the conference. Left to right at the speaker's table are E. M. Knapp, M. J. Allen, E. C. Hoenicke, J. T. Rettaliata, speaker, J. T. MacKenzie

By FRANK G. STEINEBACH
Editor
and KENNETH L. MOUNTAIN
Assistant Editor

SEVENTH annual College-Industry Conference held by the Foundry Educational Foundation at Cleveland, Mar. 10-11, drew a large attendance from professors of universities having courses in foundry practice, and leaders of the foundry industry. A small representation of students in foundry practice also attended. With E. J. Walsh, executive director of FEF presiding, Dr. James T. MacKenzie, president of the foundation, welcomed those in attendance.

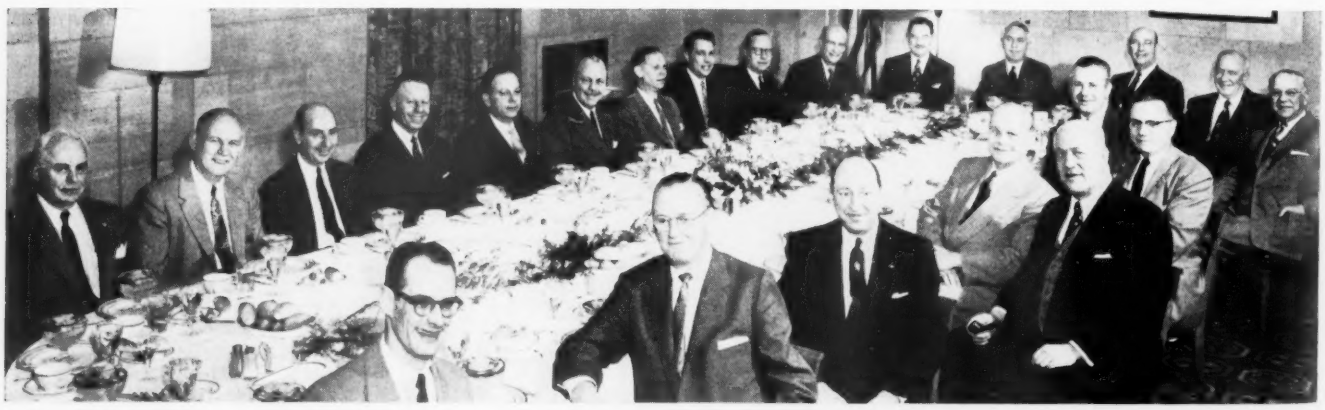
In reporting on the foundry industry, William G. Gude, managing editor of FOUNDRY, pointed to the production total of 17½ million tons of castings in 1953, which was exceeded only by the record production of 19¼ million tons in 1951. While production was high, backlogs declined, thus indicating that supply has caught up with demand after an extended period in which the seller was king. However, some believe that a large part of the adjustments in consumer inventories and in the supply-demand relationship have been accomplished.

Turning to the technical side, Mr. Gude pointed out that at no other period in the history of the foundry industry have so many noteworthy developments occurred in casting methods, equipment and materials. Effect of these developments so far have been only partially felt, but their influence will become increasingly important in the years ahead.

In the field of equipment and processes, Mr. Gude discussed developments in automatic molding machines, shell molding equipment, mold blowing machines, pressure molding, graphite molds, cupola design and operation, and reclaiming molding sand. In conclusion, he discussed a few of the interesting statistics provided from the inventory of foundry equipment, recently completed by FOUNDRY and presented on pages 146 to 163 of this issue.

University Activities—A series of talks provided reports from several of the universities. Prof. R. H. Cole, Northwestern University, Evanston, Ill., discussed the use of visual aids in demonstrating foundry practices. Northwestern is making maximum use of photographs, but Professor Cole believes there is a definite need for more motion picture films and

(*Continued on page* 279)



FEF trustees and staff members. Clockwise from left: A. M. Slichter, E. C. Hoenicke, C. V. Nass, M. J. Allen, W. W. Heimberger, J. A. Kleber, E. M. Knapp, E. J. Walsh, P. E. Rentschler, S. C. Wasson, C. A. Barnett, J. T. MacKenzie, E. C. Jeter, J. M. Price, R. P. Brewer, K. F. Lange, John McIntyre, Fred Walls, C. B. Schneible, H. P. Good, J. H. Smith, H. C. Esgar

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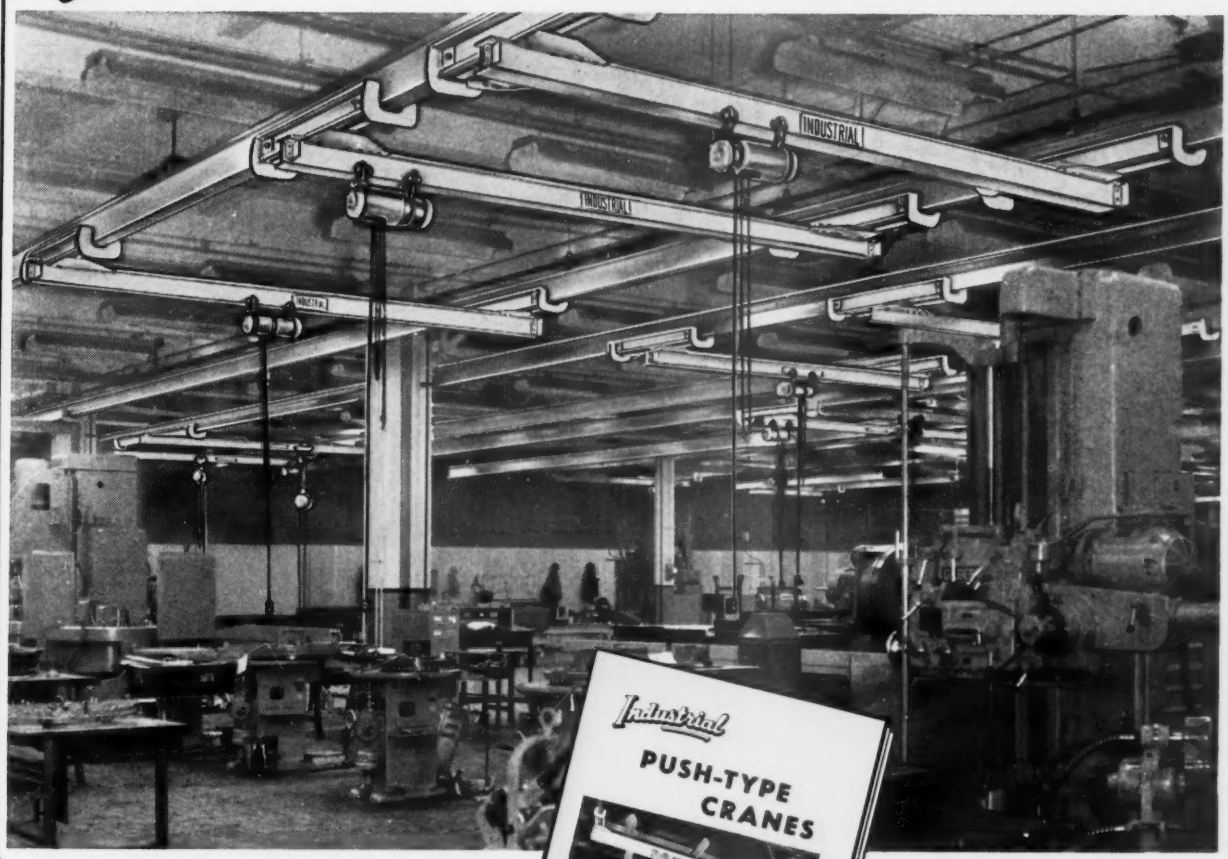

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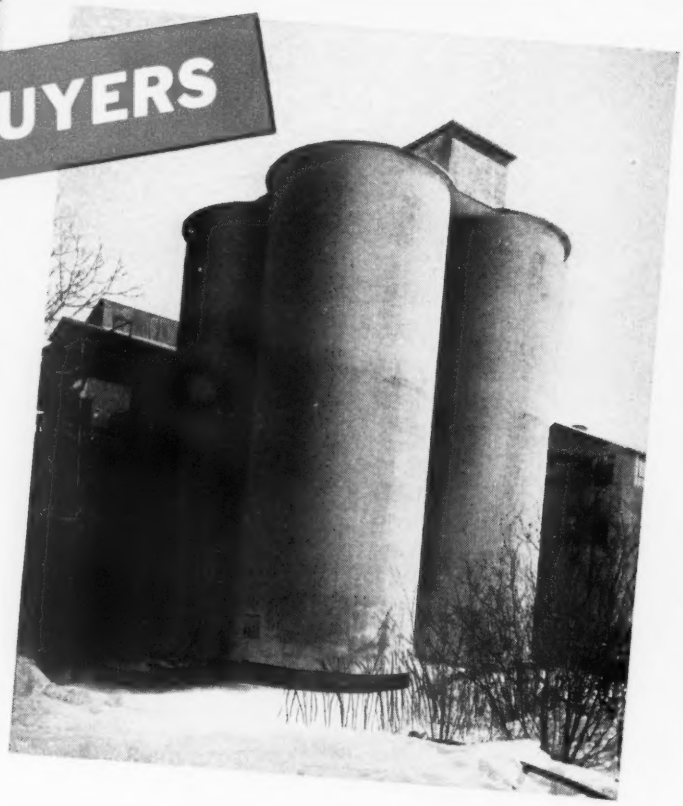

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VISIT US BOOTH 417 Foundry Show May 8-14

(*Continued from page* 276)

slides that are on the college engineering level.

In his opinion, producers of films should consider the type of individuals that will be most interested in such pictures rather than appealing to a large number of viewers. Pro-

THOMAS KAVENY JR.
FEF President

fessor Cole showed some of the photographs he has prepared in Chicago foundries for use in class instruction.

Prof. Warren Jeffery, University of Alabama, University, Ala., discussed the use of visual aids as one of the best means of putting across ideas of operations that cannot be performed in the school laboratory. A movie which he prepared for classroom use and illustrating foundry operations was shown. Professor Jeffery suggested that the FEF schools co-operate in making a movie of foundry practice. He also suggested that the FEF act as a clearing house for the exchange of slides between schools.

Prof. Peter E. Kyle, Cornell University, Ithaca, N. Y., reported on some of the activities around the university. He has found that the Sand Division research project of AFS is a good spot for the better FEF students to conduct some of the work. While Cornell does not have a student chapter, the Central New York Chapter of AFS frequently meets on the campus and thus keeps the students interested. Professor Kyle is rather concerned with the fact that he does not find as much enthusiasm on the campus for the scholarship program as was noted previously.

Prof. C. E. Bullinger, Pennsylvania State University, State College, Pa., discussed the application of staff functions to industrial management, and indicated the need for courses that will give students the background of techniques for management decisions.

Mr. Walsh presided at the second session devoted to educational activities of the universities. Prof. D. S. Eppelsheimer, Missouri School of Mines, Rolla, Mo., indicated he had received 30 to 40 informational requests on the baby cupola, with several inquiries coming from Europe. He elaborated on the difficulty of selecting a worthwhile research problem for students seeking advanced degrees.

Prof. E. R. Shorey, University of Wisconsin, Madison, Wis., spoke of his school's emphasis on the teaching and research aspects of foundry work at the graduate level. Prof. R. W. Heine, also from Wisconsin, talked about the methods of instruction used and said that recent changes in the structure of industry has led them to change the structure and methods of teaching foundry courses. They have adopted an engineering approach to provide the student with a good foundation of engineering principles that he can use in various situations to arrive at certain standards.

(*Continued on page* 282)

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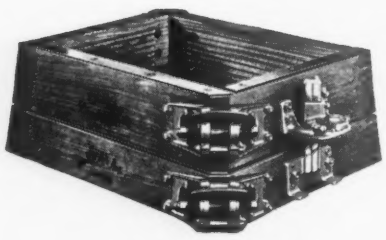
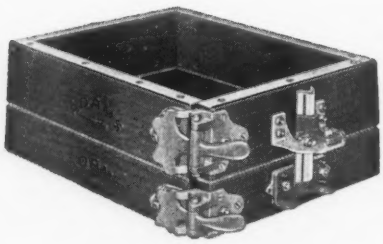
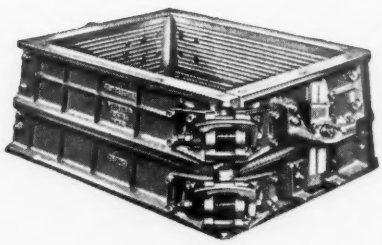
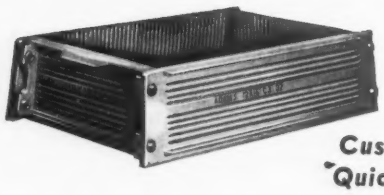
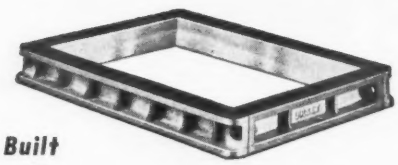
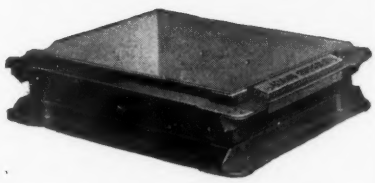

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(*Continued from page* 279)

Dr. R. A. Flinn, University of Michigan, Ann Arbor, Mich., talked about the success of their first summer course offered in 1953 and announced that two, one-week, intensive courses would be offered this August. He touched briefly upon some of the research projects now going on and reported that the student AFS chapter had 126 members and was the second largest student group on the campus. He referred to university's participation in a television series. Through simple demonstrations on these programs they were able to show engineering phenomena that could be understood. Such demonstrations have received favorable comment from viewers who have asked for a continuation of the programs.

Prof. C. C. Sigerfoos, Michigan State College, East Lansing, Mich., presented information on the benefits to industry of their educational program and offered an outline of the engineering courses available including some discussion of the foundry option course. Michigan State has an educational television station operating and one foundry show is aired each month.

Prof. G. M. Cover, Case Institute of Technology, Cleveland, described the philosophy of teaching and training at Case. The engineering approach is followed, with many plant visitations being made to study industrial operational techniques. Case is now arranging its foundry scholarship program so that two men each semester in each of four classes will be participating.

Prof. D. L. Crews, University of Cincinnati, reported that his school had no required courses in foundry practice but it operates on the cooperative plan with Cincinnati industry. Students supplement their course work with actual experience. Local industrial leaders also appear in the classroom as guest lecturers.

George K. Dreher, Waukesha Foundry Co., Waukesha, Wis., former executive director of the FEF, presided at the Thursday morning session. A program for education in foundry subjects at the secondary and vocational school level was presented by Ashley B. Sinnett, graduate student at Michigan State College, who as of Apr. 1 became head of the Educational Division, American Foundrymen's Society.

The suggested program would involve the establishment or rehabilitation of foundry courses in schools; the providing of a central source of information relative to curriculum, facilities, equipment, layouts for the schools; creation of a visual aid library; assistance in furthering a program of in-plant training; the coordination of the interests of industry and those of the schools; and the assisting in administration of foundry apprenticeship programs.

Mr. Sinnett pointed out that the providing of teaching personnel in the secondary schools is a major problem. A solution is for colleges to provide courses for training industrial arts teachers.

Recruiting by Foundries—An interesting discussion of the subject of recruiting for the foundry industry was conducted by a panel consisting of E. C. Kubicek, Illinois Institute of Technology, Arthur Bach, Case Institute of Technology, B. C. Yearley, National Malleable & Steel Castings Co., and A. C. Hensel, Albion Malleable Iron Co. Prof. P. E. Kyle, Cornell University, was moderator.

On the subject of how to plan recruiting of college students, these suggestions were offered: Visit the schools early; June graduates frequently are placed by April. Pick your interviewer carefully. Advise the school placement office of your needs.

(*Continued on page* 284)

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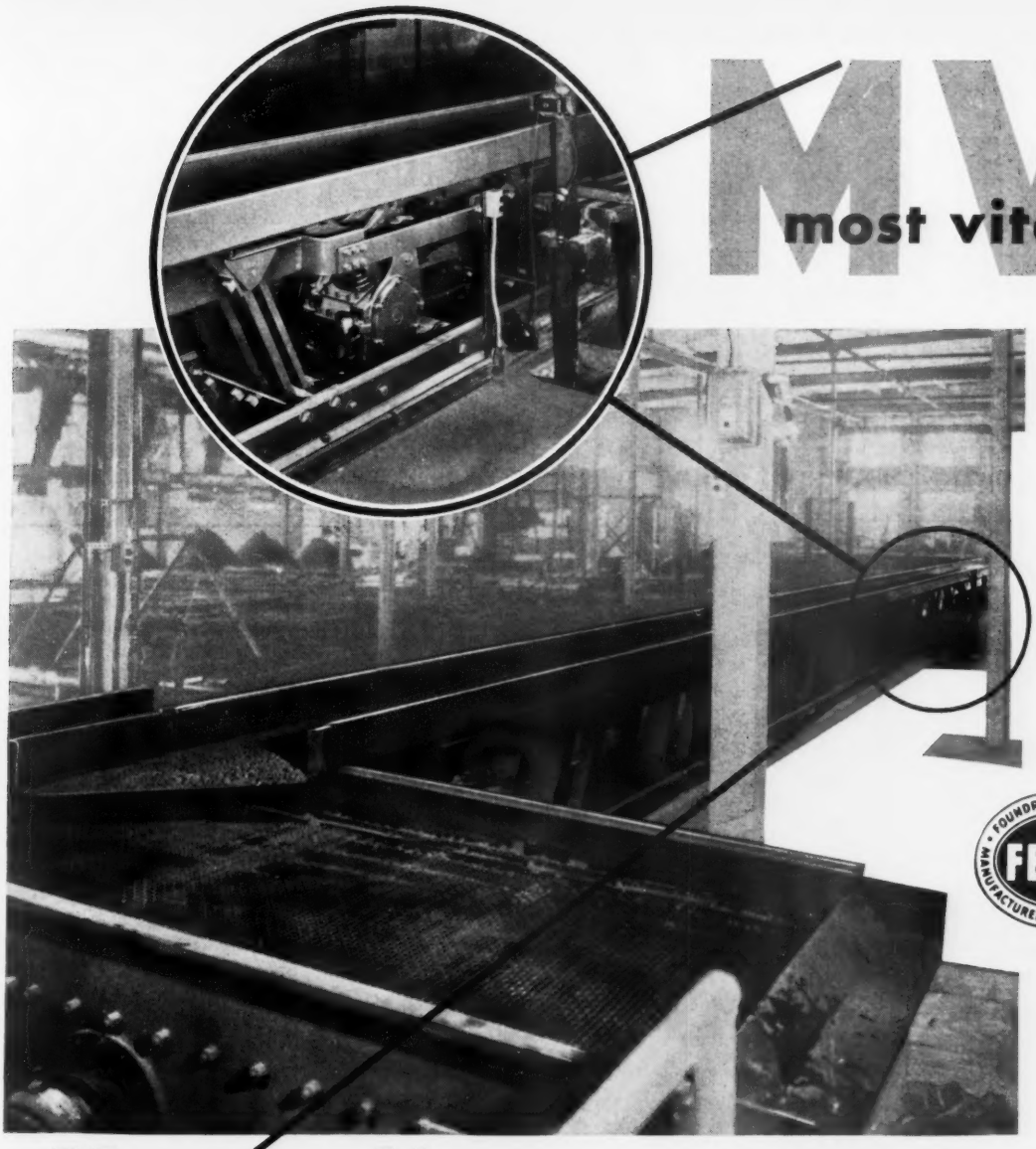

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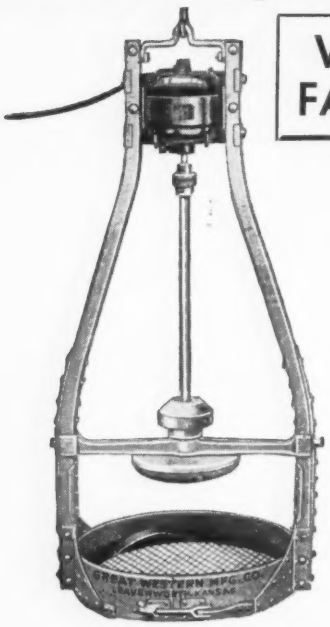
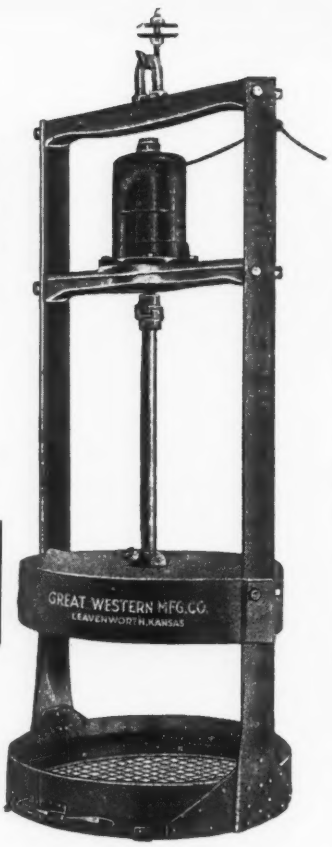


Type "V"

Screens sand Fine, Coarse, Medium. 20″ dia. sieve with special clamp for 5-second changes. Does work of 10 men. Fully-enclosed 1/6 h.p. motor. 4′ 6″ high, weight 100 lbs. 20″ Sieve: $250.00. Giant V-5, 36″ Sieve: $450.00



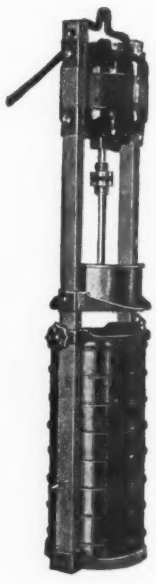
Type "CR"

24″ dia. round sieve. Thoroughly sifts, mixes, fluffs, aerates the sand. 1/3 H.P. enclosed motor. Height 4′ 6″, weight 250 lbs. Complete: $310.00

Type "CS"

24″ square sieve. Continuous operation, no dumping. Refuse tails off to one side.

Height 4′ 10″, weight 295 lbs. With 1/3 h.p. enclosed motor. Complete: $320.00



Type "HL"

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(*Continued from page* 282)

Follow up first interviews promptly, advising applicants whether or not you are interested in further discussion.

Type of engineer hired usually is not too important, according to Mr. Yearley, who thinks the notion that metallurgical training is a requisite is over-emphasized. Actually, he said, foundry work is primarily a material handling process. Of course, a large foundry may want a graduate who has specialized, but the small plant generally needs a man with basic engineering training.

It was admitted that evaluation of an applicant in a short interview is difficult. Type of personality is important since it should suit the type of job for which the graduate is sought.

A survey of 50 companies shows that in their recruiting activities they spent an average of $430 for each graduate hired, according to one of the panelists.

Comment concerning the $350 or higher monthly starting salaries offered to graduates indicated that many small companies are being priced out of the engineering graduate market. Further, that these relatively high salaries are upsetting existing wage structures among foremen and other supervisors.

Using Engineering Talent — Mr. Dreher presided at the Thursday afternoon session devoted to a panel discussion of "Absorption and Utilization of Engineering Talent in the Foundry Industry," moderator was R. V. Righter, plant manager, Central Foundry Division, General Motors Corp., Danville, Ill. Other panel members were E. J. Metzger, president, Multicast Corp., Wauseon, O.; W. J. Hebard, personnel director, Continental Foundry & Machine Co., East Chicago, Ind.; Charles F. Seelbach Jr., plant manager, Forest City Foundries Co., Cleveland, and F. J. Walls, International Nickel Co., Detroit.

Many aspects of the problems of training and absorbing young engineers into the industry were discussed, with considerable emphasis placed on the orientation and training program and what it should do, both for the trainee and for the company. Methods of getting a training program started, what the basic elements of the program should be, various approaches to training, rating of the trainee, attitude of unions toward such programs and evaluation of the program were commented upon by various panel members.

A summary of the conference was given by Prof. Howard F. Taylor,

(*Concluded on page* 286)

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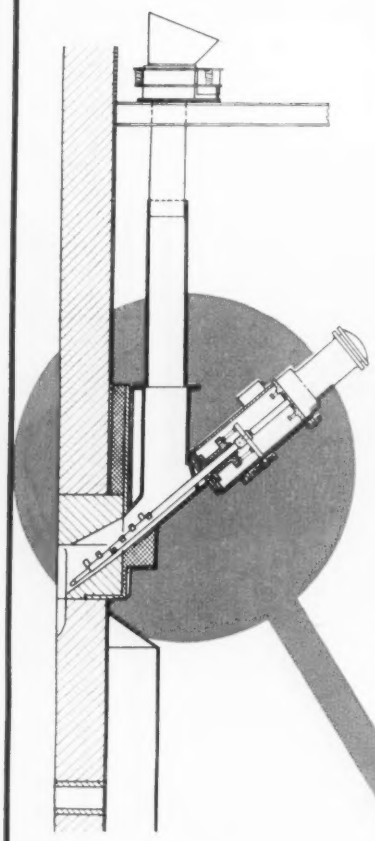

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AFS FOUNDRY SHOW BOOTH 707

MEEHANITE METAL CORPORATION

"CROFT PROCESS" DIVISION

714 North Avenue New Rochelle, N. Y.

(*Concluded from page* 284)

Massachusetts Institute of Technology, Cambridge, Mass. Professor Taylor also recommended that industry continue its financial support of the educational program, adopt a public relations program to acquaint those outside the industry with its functions, continue industry-wide research on an expanding basis, incorporate more visual aids into teaching techniques and develop an aggressive program that will give youths at the high school and vocational school level a knowledge of the foundry industry.

Dr. John T. Rettaliata, president, Illinois Institute of Technology, Chicago, was principal speaker at the Thursday evening dinner. Marion J. Allen, American Steel Foundries, presided. Dr. Rettaliata urged industry to provide more funds to private educational institutions, because industry eventually will be the beneficiary from the increased supply of trained technicians. He believes it significant that nearly one-half of the top executives of the country's twenty leading companies are engineers.

At the annual meeting of the FEF, Thomas Kaveny Jr., president, Herman Pneumatic Machine Co., Pittsburgh, was elected president to succeed Dr. James T. MacKenzie. Mr. Kaveny, who was vice president the past year, is succeeded in that capacity by E. C. Hoenicke, Eaton Mfg. Co., Detroit. E. M. Knapp, Ferro Machine & Foundry Inc., Cleveland, was chosen secretary-treasurer, and E. J. Walsh continues as executive director.

FEF trustees to serve during the coming year are as follows:

Trustees Representing Founding Members—Malleable Founders' Society: W. H. Moriarty, National Malleable & Steel Castings Co., Cleveland; Anthony Haswell, Dayton Malleable Iron Co., Dayton, O. Gray Iron Founders' Society: W. R. Tanner, Zenith Foundry Co., West Allis, Wis.; Thomas I. Curtin Jr., Waltham Foundry Co., Waltham, Mass.

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they cut sand-handling costs and boosted production with CRANE TURBO-DRIVE

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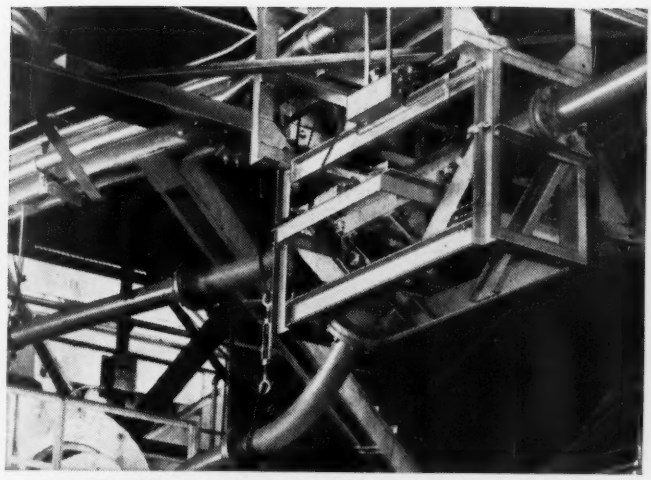
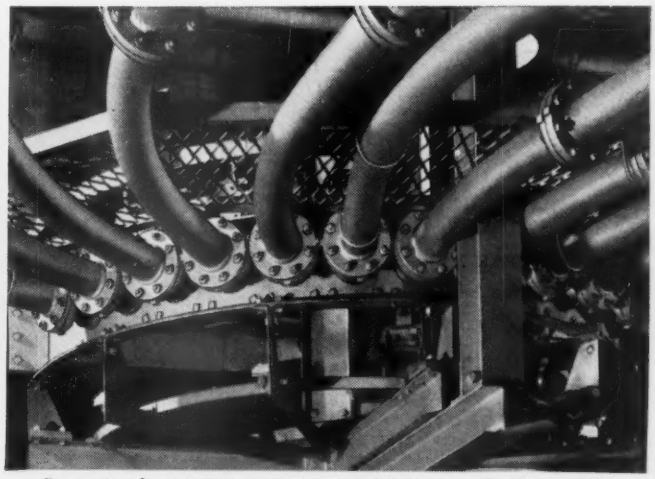
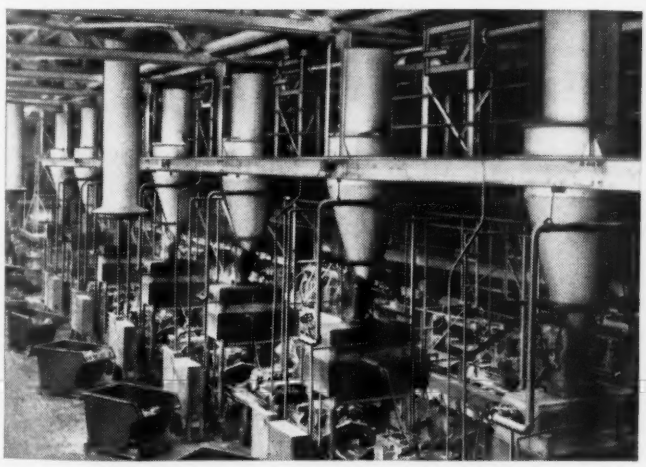


International Harvester Milwaukee Works Foundry employs Crane Turbo-Drive with single-transfer switches like these to save time, space and man power.



Eaton Manufacturing Company, Vassar, Michigan, gained over-all foundry efficiency and increased production with a Turbo-Drive multiple switch system.



Ford Cleveland Foundry found the answer to clean, safe and speedy sand delivery with a three-unit Turbo-Drive system serving 38 stations.

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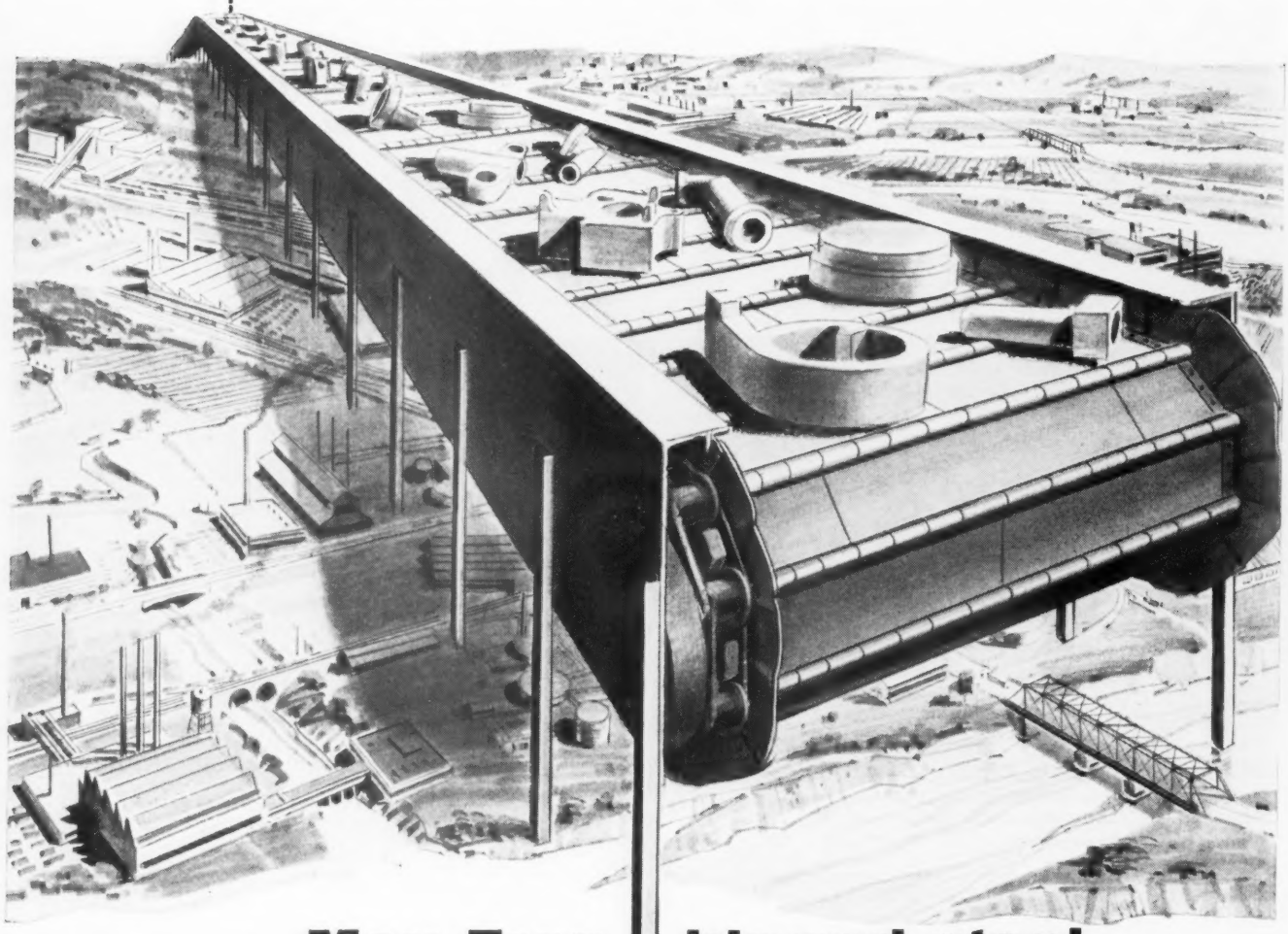
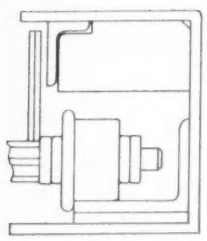
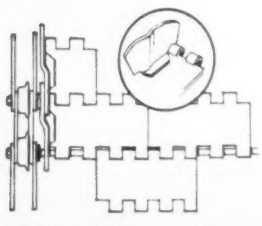


May-Fran hinged-steel conveyor belting



Drawing shows construction details of "skirt" which prevents entry of foreign matter and protects side chains.



Outside links incorporate interlocking wings . . . remain positively engaged at all times.

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DERMATITIS PREVENTION

In the Foundry Industry

Above—Well designed locker and shower room for foundry workers includes lockers through which air is circulated to keep clothing fresh

Top Left—Typical dermatitis produced by degreasing action of solvent

Left—Oil pimples or boils usually appear first at the places where oil-soaked clothing is pressed most closely against the skin surface

ABOUT half of all the compensation paid for occupational diseases is paid for dermatitis cases. Consequently, control of dermatitis is a serious problem for management in most industries.

The dermatitis case is seldom spectacular like some of the other occupational diseases. It is almost never a threat to life and is seldom disabling. A dermatitis case is, however, generally apt to be a tedious sort of thing and is particularly apt to be recurrent.

When dermatitis occurs on the face and hands, moreover, it is particularly considered disfiguring because a certain amount of social odium is attached to it. This is an inheritance from many generations ago when dermatitis cases were all associated with either leprosy or venereal disease, and were considered to be particularly unclean.

While we no longer make such associations, many people still feel that skin diseases are in some unique sense unclean. This will seldom prevent an able-bodied individual from working in the foundry industry, as it would in the food and related industries, but it will make his position uncomfortable and his relations with his fellows in the plant strained in many instances.

Avoidance Easier Than Cure—Dermatitis cases are actually much easier to avoid than they are to cure. The best advice for an existing case of dermatitis is to take it to a good physician specializing in this type of practice. It is not possible for the average man—sometimes not easy for the specialist—even to tell whether the particular case which he sees is occupational or non-occupational.

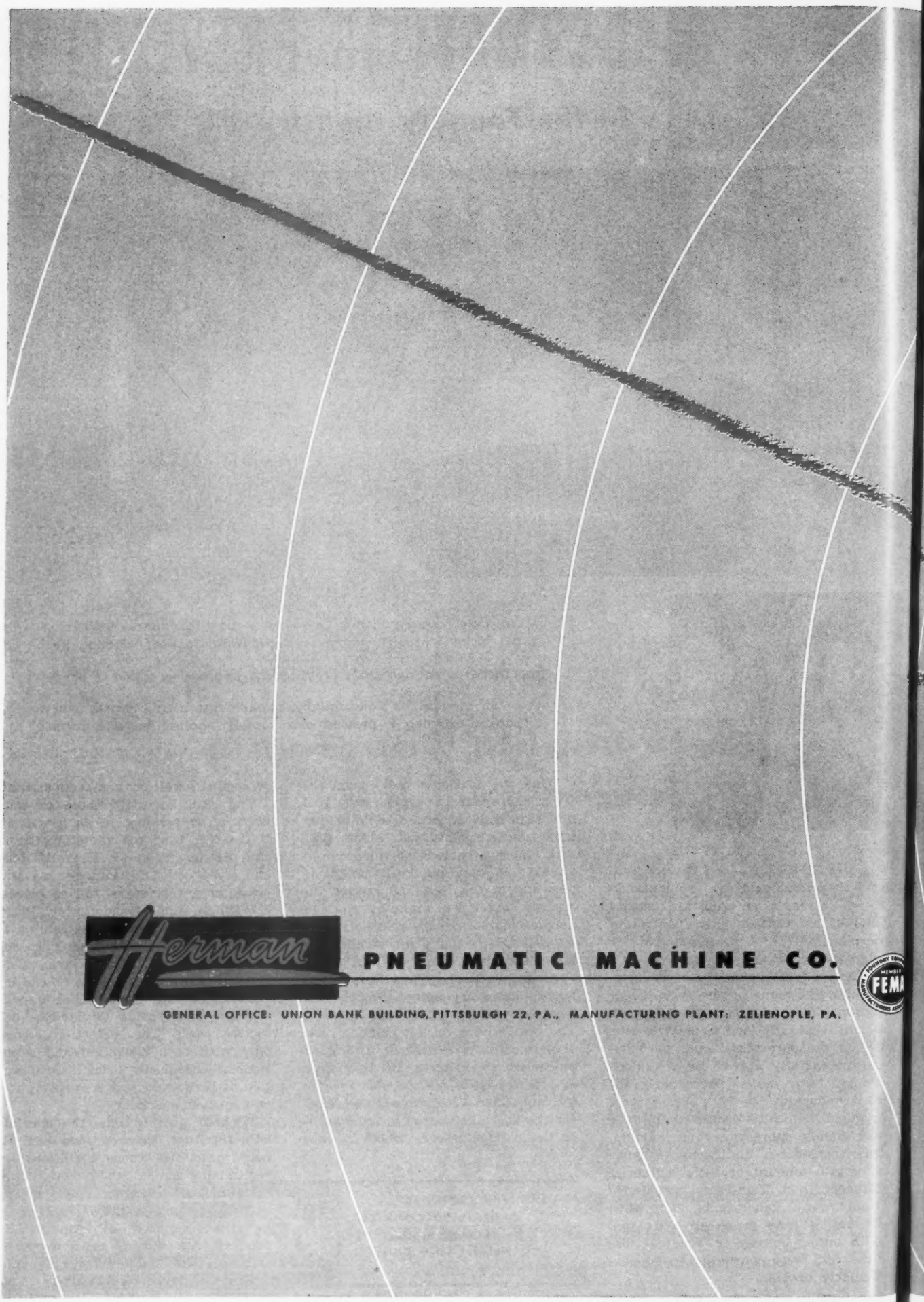
The skin has only three or four ways of responding to an irritation. It can (1) turn red and itch, (2) it can set up small or large blisters and weep or (3) it can dry up and crack or get soft and fall to pieces.

With an almost indefinitely large number of potential irritants, it should be obvious that picking out the particular irritating substance requires more than a look at the irritation on the skin. Often it will require considerable high-class detective work. This detection comes only with both education and experience; consequently, successful practice of dermatology is a rather difficult medical specialty.

Without getting into the specialist's territory, however, we can all help to control these conditions by recognizing some of the general characteristics of allergies which are of use in preventing them. First, forget the idea that a dermatitis is generally an allergy or hypersensitivity of the individual to the skin

(Continued on page 292)

By DR. FLOYD VAN ATTA
Industrial Hygienist
National Safety Council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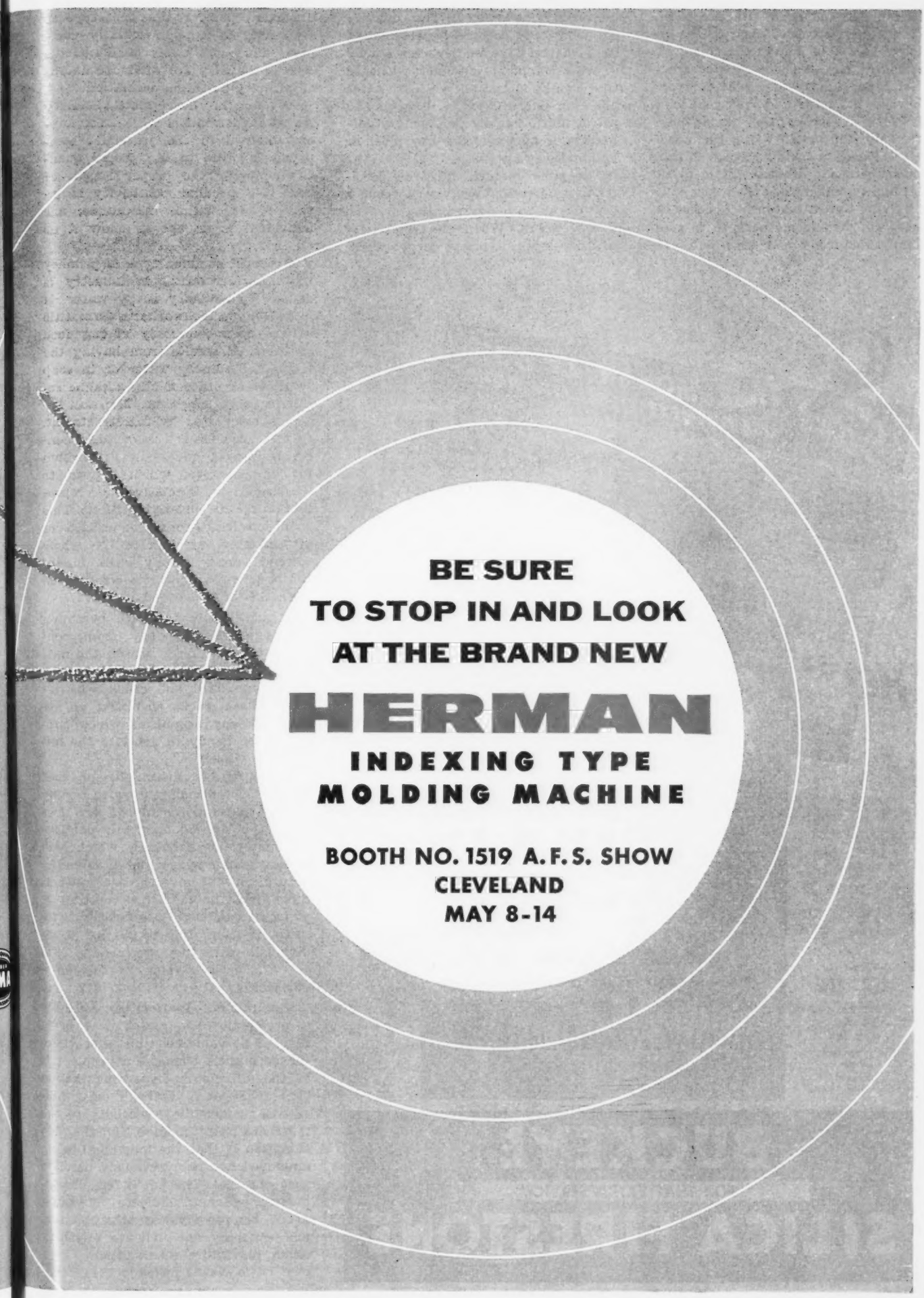
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(*Continued from page* 289)

irritant. In industrial practice it ordinarily is not an allergy. The allergy idea is a convenient shield because it indicates a particular sensitivity peculiar to one individual and beyond the control of everyone else, so that it leaves the management free of responsibility for the condition. This is a handy way of shifting one's personal responsibilities to the Almighty, but it does not work.

There are certainly occasional cases of hypersensitivity to a great many materials and they will crop up in industry. Usually they are fairly readily recognized. The individual who is to become hypersensitive to a material ordinarily can handle it with complete impunity when he first comes in contact with it. After handling it continuously, it begins to affect him either by producing a dermatitis or by producing hay fever or asthmatic symptoms.

The time required for the sensitivity to develop may vary from a few weeks to a few months, or even a few years. When the sensitivity has developed, it is apt to get worse and to be quite difficult to treat. The important point is that this type of sensitivity is not particularly common, and most cases of dermatitis seen in industry are what are known as primary irritation dermatitis.

Anyone Is Susceptible—Primary irritation dermatitis will affect anyone exposed to the particular compound involved in the proper quantity and for the proper length of time. No peculiar sensitivity is involved and, within limitations, one individual is as apt to show it as another.

The most common type of primary irritation dermatitis in industry is caused by ordinary soapy water. It is known as dishwasher's dermatitis and is seen commonly among food handlers. It results from having the hands in ordinary water or in soap solutions or other mildly alkaline solutions for a long time. The skin becomes macerated by this treatment. In its softened and macerated condition it is a good culture medium for any bacteria which happen to be around and is relatively poor protection for the underlying tissue. This condition leads to a generalized or disseminated infection of the whole softened area, usually with one of the pus-forming bacteria common on the skins of almost all people.

In addition to the skin becoming waterlogged and soggy from continuous immersion in water, the natural oil is also dried out and it tends to become hard and crack when it dries. These cracks also offer an avenue for any organisms which happen to be handy to get into the underlying tissues.

It should be rather obvious that there is no special sensitivity to any of the materials involved, nor does the action depend upon any particular materials. Anything which will make the skin soggy and dissolve the natural oil will have the same effect. Since most industrial dermatitis is of this type, there is relatively little value in attempting to patch-test individuals when they are hired to find out if they are going to develop a dermatitis.

Patch Test Ineffective—Actually a pre-employment patch test is of little or no value even in cases where the dermatitis which is a problem is of the allergic or hypersensitization type. The patch test will only indicate a pre-existing sensitivity to the materials being handled, and the presumption is that the individual being employed has not previously handled that material. The patch test, consequently cannot indicate anything about his previous sensitization and will certainly not indicate anything about his future sensitization.

(*Continued on page* 294)

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(Continued from page 292)

Actually the situation is even worse because a patch test on an individual who has not previously handled the material is one of the finest possible ways of sensitizing him. It is even less desirable to sensitize an individual who is not yet your employee than to sensitize one who is working for you.

Patch tests are occasionally used to predict the sensitizing potentials of new compounds, but in that case the technique is to make one patch test which is not expected to have any effect unless the material involved is a primary irritant; then to make a second test after 10 days or two weeks to permit the sensitivity to become established. If such tests are done on 200 or more individuals, the second patch test will probably show sensitization of one or more, if the compound being used has any particular allergenic properties. This is about the only way in which a patch test can be prophetic and is, in itself, a pretty good reason for not using patch tests as a pre-employment procedure.

Foundry Sources Limited—Only relatively few compounds used in the foundry are general causes of dermatitis. The most commonly used materials which produce dermatitis are oils of all kinds. Any of the petroleum oils are pretty fair solvents for the normal skin oils and are also mild irritants to the skin surface. When the skin is kept in contact with them, the irritation causes some inflamation which narrows the mouths of the oil glands near the hair roots, and they gradually fill up with hardened oil, producing comedoes or blackheads which later become infected with the organisms normally living on the skin to produce pimples or boils.

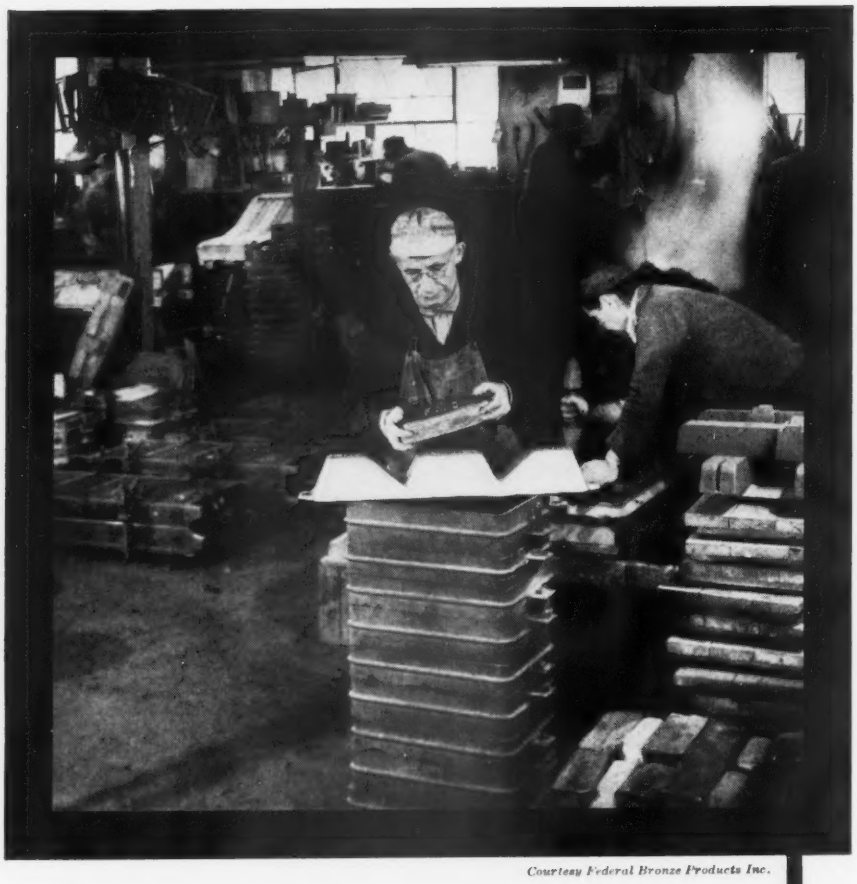
These conditions are usually seen first and most often at the places where oil-soaked clothing is pressed most closely against the skin surface, as around the wrists, on the forearms, across the back of the neck and across the front of the thighs.

Another rather common form of dermatitis is produced by a simple mechanical irritation of the skin by a fine dust. Such dusts as seacoal are particularly apt to produce this type of dermatitis. The mechanism is similar to that which produces oil pimples or oil boils; it becomes severe only when secondarily infected in the irritated areas.

Acids and bases used in pickling operations are all irritating to the skin and can also produce a primary irritation type of dermatitis.

In light metal foundries it is common to use a slightly acid bichro-

(Continued on page 296)



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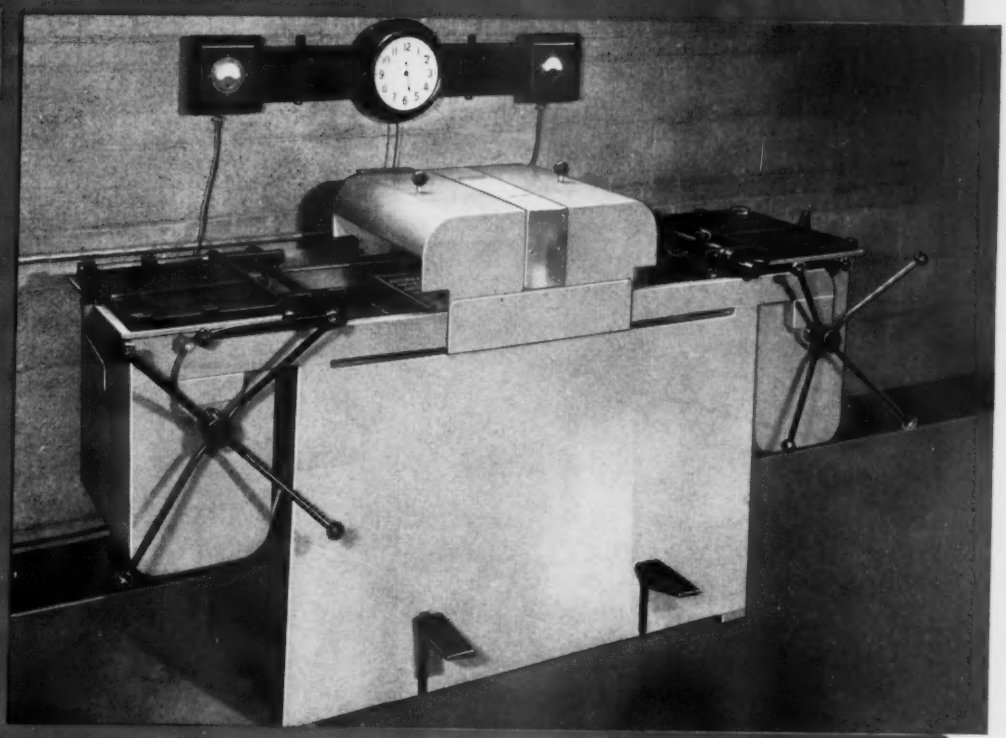

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1. **WORK-O-MATIC DROP-BOTTOM BOX.** Exclusive Union Metal square corner box of heavy gauge corrugated steel, with outturned 1" triangular bead flanges at top and bottom.
2. **CORNER STACKING ANGLES.** Permit safe group stacking—one box on another—saving valuable floor space by putting air space to work. Designed to stop end or side shifting.
3. **HINGED CHUTE BOTTOM.** Lowering of operator-controlled truck forks hinges bottom downward, automatically sliding parts into work-level tray.
4. **HEAVY-DUTY WORK-POSITIONING STAND.** Receives box from back or sides. Is safely, easily transported by lift truck from one work station to another when desired.
5. **CONTROL GATE.** Vertical adjustment controls constant flow of different size parts to service the work station.
6. **WORK-LEVEL TRAY.** Feeds parts to work station eliminating costly, tiring, hazardous stretch-bend-stoop methods. *Reservoir feature* cuts "down time" during interchange of supply boxes.
7. **SLOPING TRAY END.** Assures maximum part accessibility. Easily removed during "job finish-off". Speeds job changes.

These are only a few Work-O-Matic features making as much as 52.8% production gains at thousands of work stations. Get all the facts by writing to The Union Metal Manufacturing Company, Canton 5, Ohio, for Folder MH-809 and T. & M. Studies.

*Patent No. 2,445,038. Other patents pending.

UNION METAL
Materials Handling Equipment

(*Continued from page* 294)

mate solution for pickling. This is particularly troublesome in causing dermatitis on any exposed skin surfaces.

It is also possible to develop a dermatitis by contact with vapors in the air. This is apt to happen around core ovens where the oxidation products of the core oils may be in the air and are apt to be irritating to the skin and eyes. In some instances, phenolic materials like creosote or cresylic acid are used which may produce a dermatitis of themselves but which also produce a photosensitization, so that an individual exposed to the vapors and then exposed to the sun, even moderately, receives an extremely severe sunburn.

However, there seems to be little virtue in going on with a recitation of all the things around the foundry which may produce dermatitis. The things which may produce a general dermatitis by direct irritation of the skin are numerous. The things which may produce a hypersensitivity in certain individuals are even more. But except for the desirability of isolating the particularly bad actors so that they can be given special attention, it is not particularly important to know what are the things which cause the dermatitis specifically, since the prevention is about the same, whatever the source may be.

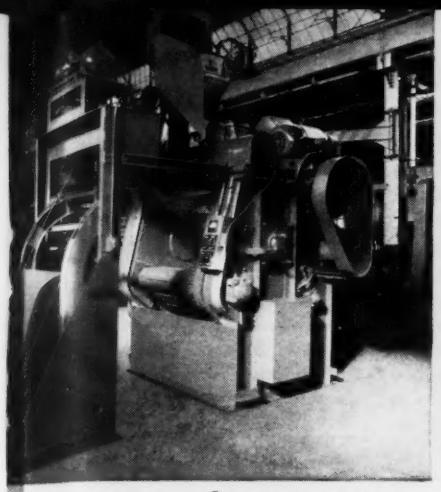
Prevent Contact with Skin

I have tried to emphasize throughout that the source of dermatitis is always long continued contact of a sufficient concentration of the material with the skin. Any device which will prevent such contact or which will reduce the concentration below that which it becomes irritating will, consequently, prevent the dermatitis.

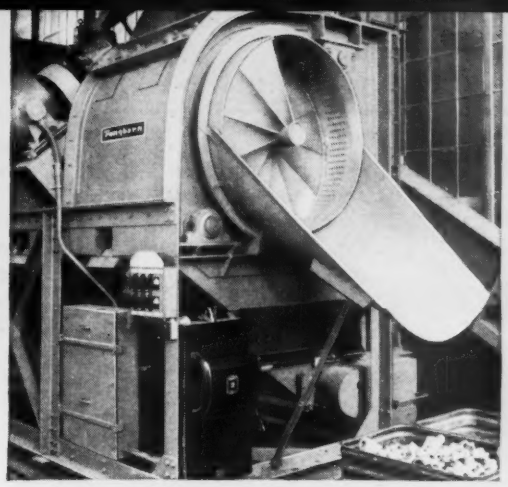
The first thing to be considered in attempting to prevent skin contact with these irritating materials is that the place for the material is in the process and not on the employee. Contact with the employee can be prevented to a considerable extent by ordinary good industrial housekeeping. This means simply keeping core oil barrels and other containers set up in racks with drip pans under them and providing proper containers for transporting them to the point of use. It means also keeping the equipment and its surroundings reasonably clean and keeping enclosures in place so that the contents remain in the equipment rather than on the man.

Second, it means good personal hygiene on the part of the individuals involved. Even if the irritating material gets on the skin, if it is

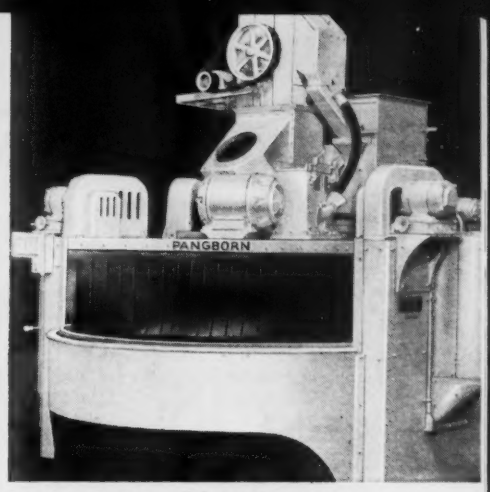
(*Continued on page* 298)



Pangborn **Blastmaster®** Barrels for top efficiency in batch cleaning. Newest addition to Pangborn line, features abrasive-tight door and automatic throw-out torque arm.



Pangborn Continuous-Flo ROTOBLAST Barrels for cleaning steady flow of miscellaneous work quickly. Operated by one man on production line basis.



Pangborn ROTOBLAST® Tables for semi-continuous blast cleaning. Types and sizes for castings of all sizes, surfaces, intricate shapes, and pockets.

Pangborn's 50 years of progress

offer you a complete line of equipment for every blast cleaning and dust control need

Fifty years of know-how . . . a half-century of research and development . . . and today Pangborn Blast Cleaning and Dust Control Equipment promises *and delivers* better, faster, cheaper performance on any foundry job. Shown here are just a few machines from Pangborn's *complete line* of equipment.

Pangborn engineers and equipment can save *you* time, labor, and money. Our engineers will be happy to work closely with you, in recommending the exact Pangborn unit you need, and in developing new equipment when necessary. No matter what you clean —large or small castings, ferrous or non-ferrous work . . . or whatever dust problem you have, it will pay you to find out how Pangborn can help you.

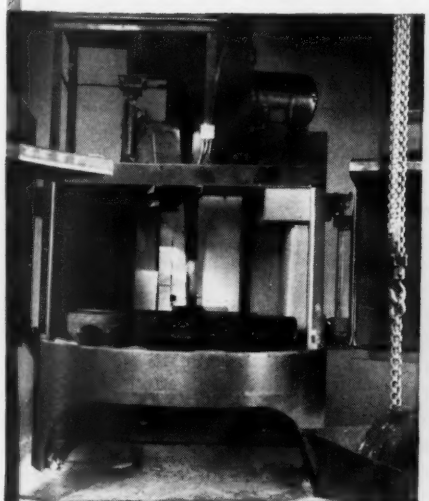
Send for the Pangborn bulletins that fit your needs. Write: PANGBORN CORPORATION, 1400 Pangborn Blvd., Hagerstown, Md.

50th ANNIVERSARY

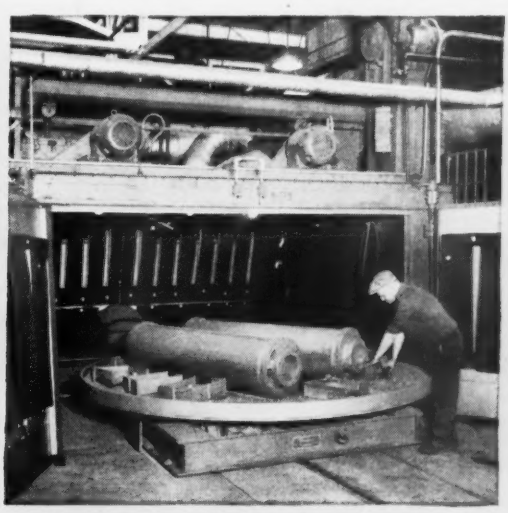
Pangborn CORPORATION

1904-1954

Visit Pangborn's booth #1415—1417, Lower Exhibition Hall, at the Foundry Show.



Pangborn ROTOBLAST Table-Rooms clean castings from a few pounds to 2½ tons. Extremely efficient for jobbing foundries. Perfect for all-purpose blast cleaning.



Pangborn Airless ROTOBLAST Rooms for general blast cleaning of extra-large and miscellaneous castings. Operated from outside.

Pangborn Dust Control Equipment to reduce housekeeping costs, minimize dust damage to machinery, improve employee morale and community relations. For any size requirement.

Slick ?
Ask any molder who's used the
MONARCH MECHANICAL
CORNER FLASK

Mr. Russo can be contacted at booths of Newaygo Engineering Co. and at International Molding Machine Co., A.F.S. Foundry Show Cleveland, May 8, 14

Easiest working lock you ever saw—Handle can be placed in any one of four positions, up or down. Precision flask pin, "Big Base" bushing means easier, more accurate draw.

Write for descriptive literature or telephone LOckhaven 8-1303

RUSSO FOUNDRY EQUIPMENT CO.
3882 Fairway Ave.
Oakland 5, Calif.

Stream lined design prevents sand from falling into the drag section in the process of closing mold. 4° and 5° tapers custom-built to meet your requirements—Prices and literature furnished on request. Slickest corner guide pin on the market completely sealed against sand. Machined sand grip surface of new design gives greater area of machined surface, true surface on cope and drag to eliminate shifts when jacket is lowered down. Controlled adjustability . . . Practically no maintenance. Aluminum alloy construction—durable, long lived and light weight.

We invite you to write for descriptive literature

RUSSO Foundry Equipment Co.

3882 Fairway Ave. Oakland 5, Calif.

TELEPHONE: LOckhaven 8-1303

(*Continued from page* 296)

washed off reasonably soon it will produce no harmful effects. Plenty of warm water, soap and a soft scrubbing brush is one of the finest combinations known to man for the prevention of all sorts of skin difficulties.

The human animal is often somewhat reluctant to get wet for some reason and it may require considerable persuasion to get employees to scrub themselves before leaving the plant at the end of the shift and, even more, to get them to wear clean clothing at sufficiently frequent intervals to keep their work clothing from being oil-soaked and filthy. The first form which such persuasion should take is certainly a good example in the way of a clean shop and facilities for doing the cleaning up. Given this much for a start and some propaganda and pressure for cleanliness, neatness and orderliness, it is possible to produce minor miracles in a relatively short time.

Use Protective Equipment

Finally, it is possible to keep out of contact with irritating materials by the use of protective equipment such as impervious clothing and protective creams. I give protective creams a relatively low place on this totem pole, but they do have their utility. Their greatest weakness is that if a man is doing any very active work, they are rubbed off shortly after they are applied. They are most useful if they are sufficiently unpleasant on the skin so as to provide a good argument for thorough cleaning up at the end of the shift or even oftener.

The final protective device is proper choice of employees. Something can be done in this direction although not as much as is often believed. It is, however, generally true that people with light-colored hair and skin tend to have thinner and drier skin than people with darker coloring. Individuals with the drier skin tend to be more susceptible to chemical irritations. People with darker and hairier skin tend to be more susceptible to irritation by oil spats and and waxes.

One should remember in attempting to apply such generalizations as these that there are very wide variations from individual to individual, and that many blondes are highly resistant to chemical irritations and many brunettes are highly resistant to irritation by oils, so that the generalizations are not too much of a help.

It is also generally true that people who are at first irritated by working conditions often develop an

(*Concluded on page* 301)

Now!

TOCCO* Induction Melting Furnaces for Precision Casting

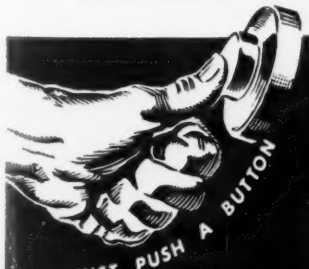
One of the TOCCO Induction Melting Furnaces used at Arwood Precision Casting Co. Note TOCCO control station in background.

● Engineers at Arwood Precision Casting Co. use TOCCO Induction Melting Furnaces for melting and remelting quality steel. Other companies have found TOCCO equally adaptable for melting non-ferrous metals. No wonder! *Look at the advantages:*

- ★ Stepless power control
- ★ Extremely Rapid Melting
- ★ High Efficiency on Intermittent Operation
- ★ Good Mixing because of Natural Agitation
- ★ Extremely Low Alloy Loss
- ★ No Carbon Pick-up
- ★ No Contamination when Composition of Charges is Changed
- ★ High Reproducibility of Results
- ★ Minimum Space Requirements
- ★ No Special Installation Charge
- ★ Simple, Safe Operation
- ★ Clean, Comfortable Working Conditions

If any of these advantages suggest economies in your operations write for full details—no obligation, of course.

THE OHIO CRANKSHAFT COMPANY



TOCCO

*Trade Mark Reg. U. S. Pat. Off.

Mail Coupon Today

NEW **FREE** BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. F-5, Cleveland 1, Ohio

Please send copy of "The Case for TOCCO Induction Melting."

Name_____

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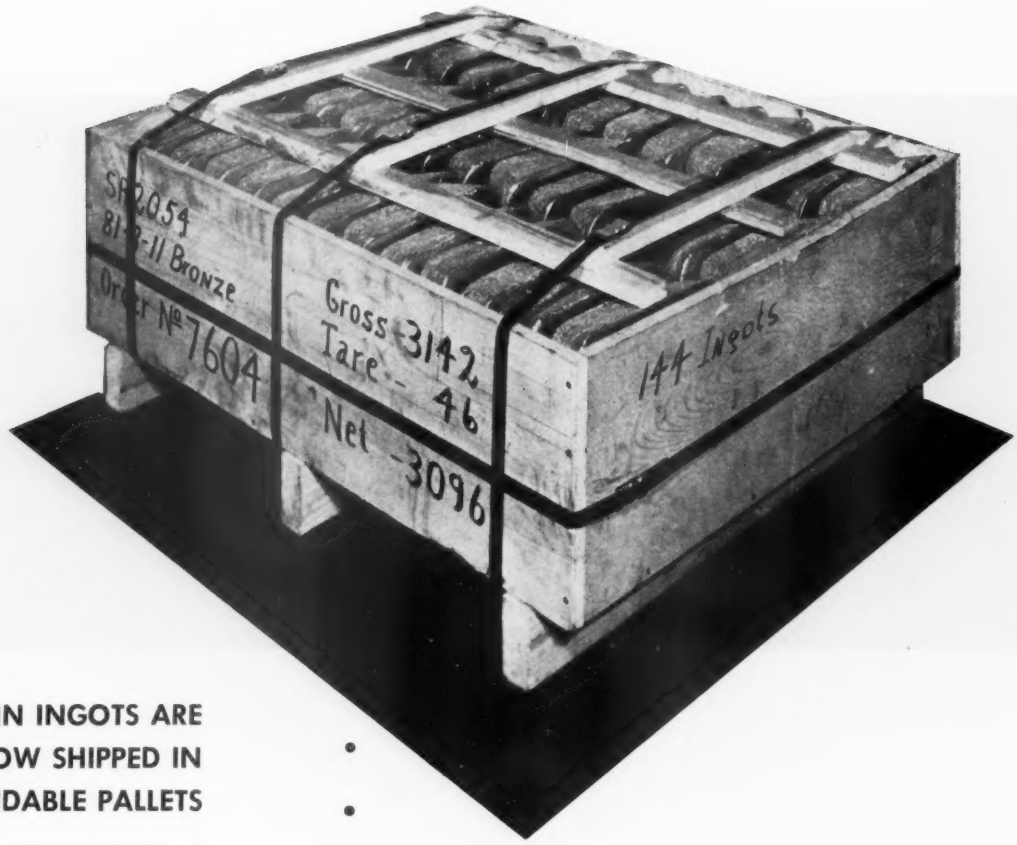
Company_____

Address_____

City_____ Zone____ State____

Schumann · Brass and Bronze Ingots



SCHUMANN INGOTS ARE NOW SHIPPED IN EXPENDABLE PALLETS

BE SURE TO SEE OUR NEW PALLET IN BOOTH 414

AT THE A. F. S. CONVENTION MAY 8 TO 14TH. Also, plan to visit us and relax in the El Gaucho Suite—Room 1048 at the Hotel Hollenden—just a few steps up East 6th Street from the Exposition Hall.

are good ingots—produced in a new modern up-to-date plant under the supervision of expert technicians whose constant endeavor is to maintain the highest possible standards of quality.

I. Schumann & Co. have recently made available to the Foundry industry an entirely new service — delivery in expendable wooden pallets. These are sturdily built pallets well marked for easy identification and inventory control. The many foundries employing fork-lift trucks will immediately recognize the value of receiving high quality **Schumann Brass & Bronze Ingots** in this manner. Send today for our complete spiral bound specification folder.

I. SCHUMANN & CO.

SMELTERS AND REFINERS

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(*Concluded from page 298*)

immunity if they stay on the job for a few weeks. It is, therefore, not advisable in general to transfer people off the job at the first sign of a skin irritation. It is more satisfactory in the end in almost every case to pay careful attention to their working conditions and personal hygiene, get them treated on the job and wait for the immunity to develop, as it likely will. If it does not develop, there will be plenty of time for thinking about transfers later on.

All of this does not sound very romantic or a good way to perform a miracle; unfortunately, prevention of dermatitis is precisely like good production technique. It requires not miracles but careful and continuous attention to detail every day and every hour that the plant is in operation.

French Society Elects New Staff Officers

The Association Technique de Fonderie (The French Foundry Association) met recently in Paris for its annual general meeting and election of officers. The newly elected officers for the current year are:

President, Gustave Rivoire. Mr. Rivoire also is president of the association of graduates of Ecole Superieure de Fonderie. Senior vice-president, Charles Cury, general manager of Fonderie Cury et Charrier. Vice-presidents, Paul Blanchard, Charles Dennery, Jean Laine, directeur de l'Ecole de Fonderie, Jacques Boucher, Guy Henon, chairman of the International Committee of Foundry Defects, and Raymond Jacquemart. General secretary, Andre Debar, professor at Ecole Superieure de Fonderie and director of a foundry at Saint-Ouen. Treasurer, Henri Prevost, directeur, Acieries de Paris et Outreaux. Society treasurer, M. Edmond Laffly, president of Societe Industrielle de Fonderie d'aluminium.

Book Review

Densening and Chilling in Foundry Work, by Edward Longden, cloth, 180 pages, 6 x 9 in., published by Charles Griffin & Co. Ltd., London. Price 28 s.

As all foundrymen are aware, the production of sound castings is based on obtaining directional or progressive freezing or solidification. While in the majority of cases it is not too difficult to arrange that condition, there are many in which the foundryman is called upon to exercise all of his ingenuity to establish mold conditions which will result in progressive solidification.

While the literature contains references and descriptions relating to the subject, those for the most part are scattered and often neglect the operating detail which is of utmost importance to those desiring to apply the procedures in their foundries.

Now, however, this book co-ordinates all the available information on applying denseners and chills to produce sound ferrous and nonferrous castings as well as wear resistance where required. The author, an eminent British foundryman well known here, and who has had considerable experience in this field, gives the benefit of his own practical knowledge as well as that gathered in his travels in this country and in Europe.

The volume is divided into 19 chapters relating to metallurgical considerations, heat conductivity of mold materials, cast iron, observations on use of denseners, types of denseners, treatment of castings, miscellaneous examples, refractory-coated denseners, application of denseners to gray iron castings, standard mold materials, chilled castings, cast iron permanent molds, steel castings, permanent molds for steel castings, nonferrous castings, densening metal by centrifugal action, and microphotographs and tables.

INTERNATIONAL CONGRESS

Will Meet in Florence in 1954

THE 21st annual International Foundry Congress, sponsored by the International Committee of Foundry Technical Associations, will meet this year in Florence, Italy, Sept. 19-26.

Congress activities will take place at the Mostra Mercato Nazionale dell'Artigianato, with the opening ceremonies at the Palazzo della Signoria (Palazzo Vecchio). Plant visitations will be organized during and after the congress, which will close with an official dinner. Sightseeing tours also will be arranged. There will be a special program for the ladies.

In conjunction with the congress, a number of exhibitions will be held, including an international exhibition of paintings, sculptures, drawings and engravings inspired by the foundry industry. Others include exhibitions of objects of art illustrating the evolution of founding; of books, manuscripts and modern publications on foundry technique; of material on teaching foundry practice; and an exhibition on casting defects.

The official language of the congress is Italian, but the services of interpreters and translators will be available at the expense of the congress committee. Reports will be printed in the authors' languages, and resumes will be provided in French, English and Italian.

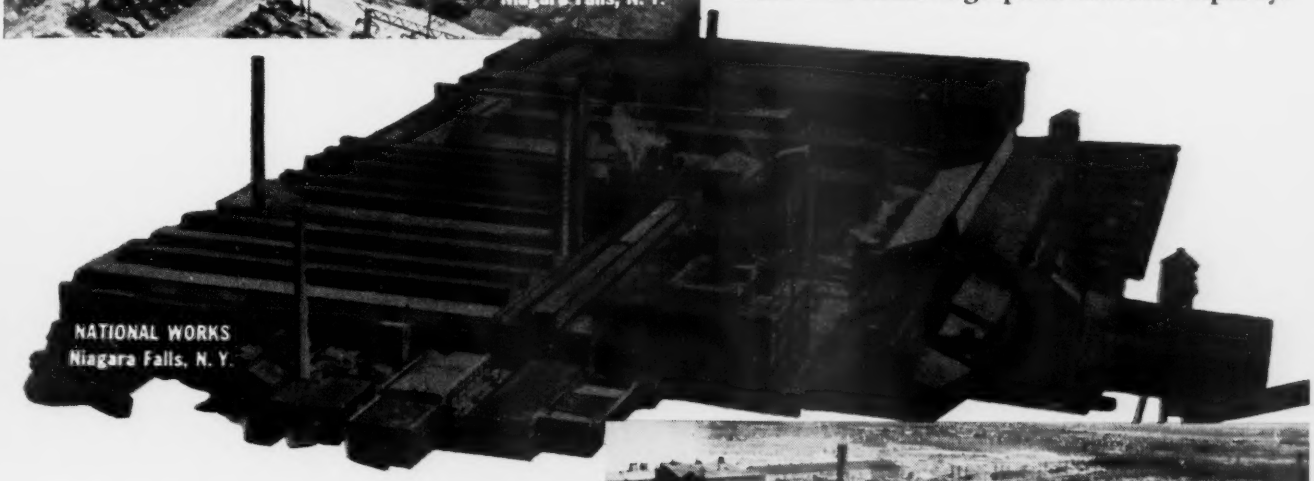
Arrangements for visitors' accommodations are in the hands of Cook Wagon-Lits, which has offices in large American cities. The New York offices are located at 587 Fifth Ave. and at 221 Broadway.

FIVE REASONS WHY NATIONAL CARBON COMPANY ELECTRIC FURNACE ELECTRODES GIVE YOU THE MOST FOR YOUR MONEY...

ELECTRODE QUALITY . . . has a direct bearing on the quality of *your* product; in many instances, it can materially affect your *cost.* National Carbon's graphite and carbon electrodes are, and always have been, the finest quality obtainable *anywhere.* We make this statement without reservation.

NEW PRODUCT DEVELOPMENT . . . is basic in technological progress. National Carbon has *always* done the major part of this country's electrode research and development . . . a share out of all proportion even to its outstanding leadership in the production and sale of these products. This is a matter of long-standing record.

PLANT CAPACITY . . . National Carbon's ability to *produce* is at an all-time high. The five plants shown here are fully integrated for production of both carbon *and* graphite electrode products — a situation rare in the industry and in keeping with National Carbon's far-sighted planning to pace requirements of a rapidly-expanding economy. For example, plant additions in the last five years alone have more than doubled graphite electrode capacity.



EXPERIENCE . . . of National Carbon is the foundation, building blocks and cornerstone of electrode-products manufacture in this country. First with commercial production of both carbon and graphite electrodes in the early 1900's, National Carbon introduced the first of each increasingly larger electrode size from that time to the present, plus a host of successful accessory items for improved application of electrodes in the metallurgical field. Today, National Carbon is the only company producing carbon electrodes up to 45″ diameter; graphite electrodes to 35″. Even larger electrodes and other massive shapes can be made with present facilities. Inquiries are invited.

RESPONSIBILITY . . . to customers and to the industry as a whole . . . expresses itself several ways in National Carbon history. The company has consistently kept ahead of demands for both quality and size of electrode products; National Carbon research stands virtually alone in the steady march of new product development; and, in the field of *service,* National Carbon is supreme. For many years we have conducted an expanding, electrode technical-service operation, staffed by a group of electrode experts, specially trained to help you get *more for your electrode dollar.*

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EAST COAST REGIONAL CONFERENCE

Considers Economical Foundry Operations

At the luncheon meeting on Friday, Mar. 12, Frank B. Rote, Albion Malleable Iron Co., Albion, Mich., spoke on "Quality Control in the Foundry." Left to right at speaker's table are W. H. Baer, Bureau of Ships, conference chairman; Harry Kessler, Sorbo-Mat Process Engineers, St. Louis; W. W. Maloney, AFS secretary-treasurer; W. D. Bryden, Philadelphia Bronze & Brass Corp., luncheon chairman; Mr. Rote; AFS President Collins L. Carter, Albion Malleable Iron Co., Albion, Mich.; Bernard N. Ames, Doran Manganese Bronze Co., Brooklyn, N. Y.; and H. L. Ullrich of Sacks-Barlow Foundries, Newark, N. J.

By EDWIN BREMER
Metallurgical Editor

AFTER an interval of seven years the Chesapeake, Metropolitan and Philadelphia Chapters of the American Foundrymen's Society joined forces to sponsor an East Coast Regional Foundry Conference in Philadelphia, Mar. 19-20. Nearly 500 attended the two-day meeting, which was held at the Benjamin Franklin Hotel with Chesapeake as the host chapter.

William H. Baer, Bureau of Ships, U. S. Navy Department, Washington, and general chairman of the conference welcomed those in attendance and introduced Collins Carter, Albion Malleable Iron Co., Albion, Mich., and national president of AFS. The latter enumerated the benefits of the society to its members, pointing out that they are in proportion to the members' participation in its activities.

Opening technical session was devoted to a discussion of the "Principles of Gating and Risering" by William S. Pellini, Naval Research Laboratory, Washington. R. J. Ely, American Brake Shoe Co., Mahwah, N. J., and R. B. Fischer, Ingersoll-Rand Co., Phillipsburg, N. J., were chairmen.

Mr. Pellini introduced his subject by pointing out that the various commercial casting alloys freeze differently, although they follow the same pattern of forming an outside solid skin or shell, beneath which is a mushy layer of mixed liquid and crystals, with a liquid center. Since the extent of those sections varies with different alloys, adjustments in gating and risering must be made to produce sound castings.

In any case, the riser must be the last portion to freeze, and it also must provide sufficient metal to feed the casting during solidification. Shape of the casting affects functioning of the riser, and this Mr. Pellini illustrated with three simple shapes of equal volume—a cube, a thick square plate and a thin plate. For the cube, the riser diameter should be 1.1 T (thickness), for the square plate 1.6 T and for the thin plate 2.5 T.

Mr. Pellini then discussed the distance that risers and gates might be expected to feed to produce sound sections, pointing out that the information is available in the literature, and that most of the work applies to steel castings. While some work has been performed with other alloys it has not progressed as far. For example, in bronzes the mode of solidification indicates the presence of considerably more of the "mushy" mixed liquid and crystals between the solid skin or shell and the liquid interior which makes bronzes difficult to feed.

Experimental work indicates that application of taper or wedge-shape chills aids in promoting directional solidification. In this the thick end of the wedge is near the outer end of the section being fed while the thin part of the wedge is near the gate or riser. He also explained that in the case of gray iron the precipitation of graphite during solidification exerts sufficient pressure to force the remaining feed metal into the interstices between the dendrites or crystals, resulting in sound sections. However, in the case of nodular cast iron the formation of nodular graphite does not create pressure since it occurs in the solid rather than the liquid phase, and feeding problems are similar to those

(*Continued on page* 306)

This illustration is a general view of the Saturday session on shell molding

VANCORAM PRODUCTS

PRODUCT	TYPICAL COMPOSITION	APPLICATIONS
ALUMINUM ALLOYS		
Alsifer	Aluminum.....20% Silicon.....40% Iron.....40%	Used principally as a steel deoxidizer and for grain size control.
Deoxidizing Grades	Aluminum..85 to 99%	Standard grades.
Silicon Aluminum	Silicon.....5 to 20% Aluminum.....Bal.	For sand, permanent mold and die casting.
Titanium Aluminum	Titanium..2½ and 5% Aluminum.....Bal.	For grain refinement and improved physical properties of commercial aluminum alloys.
Vanadium Aluminum	Vanadium..2½, 5, 10% Aluminum.....Bal.	For control of thermal expansion, electrical resistivity, and grain size of commercial aluminum.
BORON ALLOYS		
Ferroboron	Boron.....14/18% Carbon.....1.50% Silicon....max. 5.00% Aluminum.max. 0.10%	For adding boron to steels and irons.
Vanadium Grainal No. 1	Vanadium.....25.00% Aluminum.....10.00% Titanium.....15.00% Boron.....0.20%	Practical and economical intensifiers, for controlling and increasing the capacity of steels to harden, and for improving other important engineering and physical properties.
Grainal No. 79	Aluminum.....13.00% Titanium.....20.00% Zirconium.....4.00% Manganese.....8.00% Boron.....0.50% Silicon.....5.00%	
CHROMIUM ALLOYS		
Ferrochromium Briquettes	Hexagonal. Weigh approx. 3⅜ lb., contain 2 lb. of chromium.	A practical and convenient form for adding ferrochromium to the cupola.
High Carbon Grade	Chromium....66/70% Carbon.....4/6%	For wrought constructional steels and steel and iron castings.
Iron Foundry Grade	Chromium....62/66% Carbon.....4/6% Silicon.....6/9%	For alloyed cast irons. Ladle addition readily soluble at lower temperatures of cast iron.
Low Carbon Grades	Chromium....67/72% Carbon....06%, .10%, .15%, .20%, .50%, 1.00% and 2.00% max.	For low carbon chromium steels, especially those with high chromium content, such as stainless steels and heat-resistant types.
Exlo Max. .025 Carbon Grade	Chromium....67/72% Carbon...max. 0.025% Silicon....max. 1.00%	A special extral low carbon ferrochromium with high chromium to carbon ratio, high density and exceptional cleanliness. Especially adapted for use in .03 C max. stainless and other stainless steels, heat resistant and alloy type metals.
Max. .06 Carbon Grade	Chromium....67/72% Carbon....max. 0.06% Silicon....max. 1.00%	A special low carbon ferrochromium similar in characteristics to max. .025% carbon grade but for use where the extra low carbon content is not as essential.
Low Carbon Ferrochrome-Silicon	Chromium....39/42% Silicon.....40/42% Carbon....max. 0.05%	Used in stainless steels to reduce chromium oxide from slag and to add chromium to steel.
Experimental Ferrochrome-Silicon Alloy	Chromium....48/52% Silicon.....25/30% Carbon....max. 1.50%	For simultaneous addition of chromium and silicon to low alloy steels and cast iron.
SILICON ALLOYS		
Ferrosilicon Briquettes	Two sizes, both cylindrical. The smaller contains 1 lb. of silicon; the larger, 2 lbs. of silicon.	A practical and convenient form for adding ferrosilicon to the cupola.
25/30% Grade	Silicon.....25/30%	To deoxidize open hearth steels and add silicon to cast iron.
50% Grade	Silicon.....47/52%	To deoxidize and add silicon to steels and cast irons.
Silblok 25 & 50	Same as above	Blocking grades especially processed to give high density, uniform analysis, greater cleanliness.
65% Grade	Silicon.....62/67%	For deoxidation and for addition of silicon to high silicon steels.

PRODUCT	TYPICAL COMPOSITION	APPLICATIONS
SILICON ALLOYS *(continued)*		
75% Grade	Silicon.....74/79%	For high content silicon steels.
80/85% Grade	Silicon.....80/84.9%	For high silicon addition to steel; for slag treatment and graphitization of iron; for making magnesium.
85/90% Grade	Silicon.....85/89.9%	
90/95% Grade	Silicon.....90/95%	
Silicon Metal	Silicon.....min. 96%	For making aluminum, other nonferrous alloys and silicones.
SPECIAL FOUNDRY ALLOYS		
Graphidox No. 4	Silicon.....48/52% Titanium.....9/11% Calcium.....5/7%	Graphitizer for high strength cast irons; reduces chill; supplementary deoxidizer for cast steel.
Noduloy Alloys (Various Types)	Magnesium...5/16.5% Silicon.....37/67% Copper.....0/18% Iron.....Bal.	Magnesium-containing alloys for addition to molten cast iron for manufacture of nodular iron.
V-5 Foundry Alloy	Chromium....38/42% Silicon.....17/19% Manganese.....8/11%	To reduce chill and increase strength and hardness of cast iron.
TITANIUM ALLOYS		
Ferrotitanium High Carbon Grade	Titanium.....15/18% Carbon.....6/8%	To control rimming action and deoxidize steel.
Medium Carbon Grade	Titanium.....17/21% Carbon.....3/4.50%	To deoxidize and to add titanium to killed steels.
Low Carbon Grades 25% Titanium	Titanium.....20/25% Carbon....max. 0.10% Silicon....max. 4.00% Aluminum.max. 3.50%	Carbide stabilizer in high chromium corrosion-resistant steels of extremely low aluminum content. Deoxidizer for some steels.
25/32% Titanium Special	Titanium.....25/32% Carbon....max. 0.10% Silicon....max. 4.00% and 5.00% Aluminum...max. 1.50 to 5.00%	Alloy of high titanium-to-aluminum ratio for adding relatively large amounts of titanium to stainless and heat-resistant steels.
40% Titanium	Titanium.....38/43% Carbon....max. 0.10% Silicon....max. 4.00% Aluminum.max. 8.00%	Carbide stabilizer in high chromium corrosion-resistant steels.
VANADIUM ALLOYS		
Ferrovanadium Iron Foundry Grade	Vanadium.....38/42% Silicon.....7/11% Carbon.....about 1%	Imparts remarkable improvement in physical properties of iron with no sacrifice of machinability.
Grade A (Open Hearth)	Vanadium.....50/55% Silicon....max. 7.50% Carbon....max. 3.00%	For low vanadium steels and vanadium cast irons.
Grade B (Crucible)	Vanadium.....50/55% Silicon....max. 3.50% Carbon....max. 0.50%	For tool steels and other high vanadium steels requiring a limited silicon addition.
Grade C (Primos)	Vanadium.....50/55% 70/80% Silicon....max. 1.25% Carbon....max. 0.20%	For making the highest vanadium and the lowest silicon addition to tool steels.
Vanadium Metal 90% Grade	Vanadium.....91.15% Aluminum.....2.25% Silicon.....0.50% Carbon.....0.17%	For special iron-free (non-ferrous) or low iron alloys or low impurity ferrous alloys.
99.7% Grade	Vanadium.....99.7%	Principally for research on the properties of pure alloys.
Vanadium Pentoxide, Tech. Fused Form	V_2O_5.....88/92%	A source of vanadium in basic electric furnace steels. A base for numerous chemical compounds.
Air-Dried Form	V_2O_5.....83/85%	Base for chemical compounds.
Ammonium Meta Vanadate, Tech.	NH_4VO_3.....min. 99%	For making sulphuric acid, synthetic organic compounds and vanadium chemicals.

Also special alloys, chemicals and metals of Aluminum, Chromium, Silicon, Titanium and Vanadium.

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(*Continued from page* 304)
of steel.

Following Mr. Pellini's discussion a panel composed of J. Fecko, Worthington Corp., Harrison, N. J.; T. M. Blank, Pennsylvania Malleable Iron Corp., Lancaster, Pa.; Earl J. Bush, U. S. Naval Gun Factory, Washington; and E. H. Berry, Dodge Steel Co., Philadelphia, commented on his remarks. Mr. Fecko inquired whether more work will be done on gray iron gating and risering, and the speaker pointed out that present indications are that gray iron does not suffer from centerline shrinkage, and the problem is not as pressing as with other alloys.

Mr. Blank asked about feeding malleable iron and the reply was that it appears to fit in between nodular cast iron and steel. Mr. Bush said that use of high-oxygen copper in formulation of bronzes appears to give much better results than the regular type of copper, and Mr. Pellini stated that in copper-base alloys a gas problem as well as a feeding problem might be present, and to obtain solid castings it is necessary to eliminate the gas, and build in directional solidification in the gating and risering system.

Following a luncheon at which W. D. Bryden, Philadelphia Bronze & Brass Corp., Philadelphia, and chairman of the Philadelphia Chapter, presided, Frank B. Rote, Albion Malleable Iron Co., Albion, Mich., spoke on "Quality Control in the Foundry." According to the speaker, such control should be carried on by a trained departmental group in co-operation with the operators, and to function properly must have the backing of management.

The group must set up quality standards for castings based upon competitive conditions, other methods of fabrication, etc. It also has to eliminate minor salvage operations such as regrinds, etc., which can be quite expensive. For good results quality control must be set up in every department.

Mr. Rote illustrated charts showing the analyses of cupola iron taken every hour, and indicated the methods of adjusting composition to maintain uniformity. Similar charts were shown for the air furnace metal. Included in his remarks was reference to routine checking of flask pins to minimize shifts. In conclusion, Mr. Rote stated that the quality control man first should be a foundryman with the statistical phase relegated to a secondary role.

Roundtable meetings on the economics of good melting were held Friday afternoon. Top view, left to right, at the brass and bronze session, are H. C. Ahl Jr., Down River Casting Co., Rockwood, Mich., speaker, and Co-chairmen C. Schwalje, Worthington Corp., Harrison, N. J., and Earl J. Bush, U. S. Naval Gun Factory, Washington. Left to right, center, at the malleable session, are J. H. Lansing, Malleable Founders' Society, Cleveland, speaker, and H. L. Ullrich, Sacks-Barlow Foundries, Newark, N. J., and W. H. Cantwell, Eastern Malleable Iron Co., Wilmington, Del., co-chairmen. Left to right, bottom, at the steel session, are Co-chairmen E. H. Berry, Dodge Steel Co., Philadelphia, and Clyde B. Jenni, General Steel Castings Co., Eddystone, Pa., and Clarence E. Sims, Battelle Memorial Institute, Columbus, O., speaker

Consider Economic Melting

The afternoon sessions comprised a series of roundtable meetings on economics of good melting, and was divided into five sections. The meeting on malleable iron was under the direction of H. L. Ullrich, Sacks-Barlow Foundries, Newark, N. J., and W. H. Cantwell, Eastern Malleable Iron Co., Wilmington, Del., with James H. Lansing, Malleable Founders' Society, Cleveland, as discussion leader. That on steel had Clarence E. Sims, Battelle Memorial Institute, Columbus, O., leading the discussion. Clyde B. Jenni, General Steel Casting Corp., Eddystone, Pa., and E. H. Berry, Dodge Steel Co., Philadelphia, were chairmen.

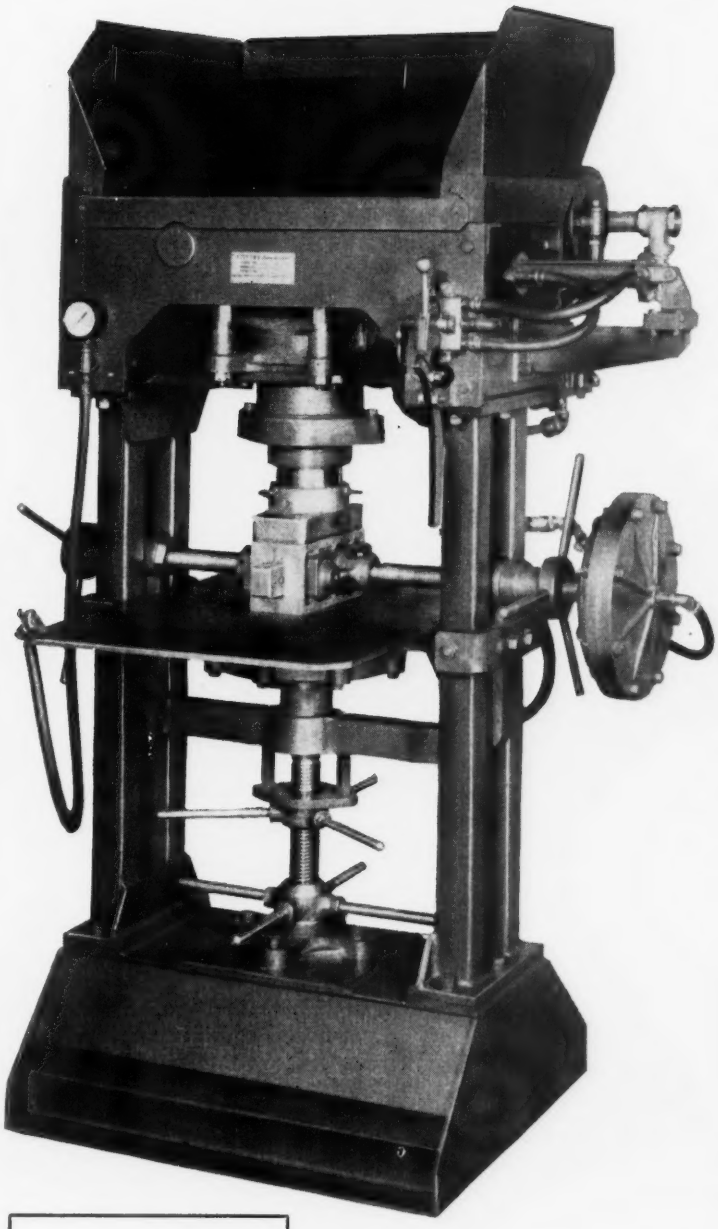
Presiding at the gray iron session were Hermann P. Good, Textile Machine Works, Reading, Pa., and L. H. Gross, American Radiator & Sanitary Corp., Baltimore. Harry Kessler, Sorbo-Mat Process Engineers, St. Louis, led the discussion.

J. O. Danko Jr., Arlington Bronze & Aluminum Corp., Baltimore, and E. V. Lanfranke, Rolle Mfg. Co., Lansdale, Pa., directed the meeting on aluminum and magnesium which had Don L. LaVelle, American Smelting & Refining Co., Barber, N. J., as leader.

Chairmen of the brass and bronze session were Earl J. Bush, U. S. Naval Gun Factory, Washington, and C. Schwalje, Worthington Corp., Harrison, N. J. Discussion leader was

(*Continued on page* 308)

Redford NO. 4 CORE BLOWER



Designed to add more power, capacity and speed to traditional Redford simplicity, flexibility and convenience, the No. 4 Redford superbly fills the need for a truly fast and flexible machine to blow cores from a few ounces to 10 lbs.

There is no need for the operator to wait for the machine at any time—the fast operating cycle permits immediate release of the core box after the cores have been blown.

Exhaust air is utilized to thoroughly fluff the sand remaining in the sand magazine after each blow, thus reducing the possibility of cratering.

Magazine heads normally furnished with the No. 2 Redford machine can be used with the No. 4 Redford. Larger new type magazine heads are also available as standard equipment.

A completely new fully adjustable clamp for vertically parted core boxes simplifies core box set up—when not needed the clamp units can be adjusted all the way out or completely taken off the machine.

Redford No. 4 users report production up to 8 boxes per minute using only one core box per machine. To get complete information write for Specification Bulletin 4.

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Cores at right illustrate wide range of work that can be done with the Redford No. 4 Core Blower.

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(*Continued from page* 306)

H. C. Ahl Jr., Down River Casting Co., Rockwood, Mich.

Consensus of the speakers at the various sessions was that the most economical molten metal is that with the best quality. Relatively speaking, such metal also is the cheapest commodity since it is only after pouring in a mold to make a casting that the cost goes up. Hence, a defective casting constitutes expensive metal.

Closing session on Saturday morning was devoted to a discussion of shell molding. Bernard N. Ames, Doran Manganese Bronze Co., Brooklyn, and K. Davis, Budd Co., Philadelphia, were chairmen, and Thomas W. Curry, Lynchburg Foundry Co., Lynchburg, Va., was the speaker. In introducing his subject he said three questions usually are raised relative to the adoption of the shell molding process. One is how to obtain sufficient personnel trained in shell molding; another is whether a sufficient market is available to justify entering the field; finally, is pilot work necessary.

Mr. Curry pointed out that each foundry would have to develop its own personnel to the market, it also must be developed by studying castings and selecting those which can be improved greatly by shell molding compared with other methods. Pilot work is essential to determine the advantages of shell molding with specific castings as well as to ascertain best procedure, and usually is conducted on a scale commensuurate with the size of the foundry.

In discussing shell molding Mr. Curry pointed out that while many values of dimensional tolerances are given, a careful study is required to determine what can be accomplished consistently. For example, if all the critical dimensions are on one side of a shell it is possible with gray iron to obtain tolerances of plus or minus 0.002-in. per in. However, when they extend across the joint of a mold, or a core is used, one only can expect tolerances in the range of plus or minus 0.01 to 0.02-in. per in., and sometimes it may be only 0.06-in. per in.

Need Greater Tolerances

Unequal cooling of casting areas tends to cause out of roundness in circular pieces, and large, flat surfaces are difficult to produce where close tolerances are involved. However, the speaker stated that excellent uniformity in dimensions from casting to casting is obtained. With larger castings more liberal tolerances must be allowed since they are harder to obtain than with small castings. According to Mr. Curry, one large group of shell mold castings permitted a 52 per cent reduction in machining costs while in another the weight of the castings was reduced from 80 to 60 lb.

He said that the smoother surfaces and closer dimensional tolerances obtained made it necessary to handle such castings carefully, palletizing being recommended in shipping. He believes that pattern and pattern plate should be made integral to eliminate the heat transfer problem when separate pieces are used. Location of ejector pins on the patterns should be such as to minimize any tendency of warping of the shell during release.

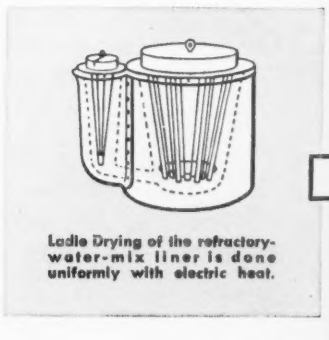
Following the speaker's talk a panel composed of E. H. Rubovitz, Newark Pattern Works, Newark, N. J.; J. F. Somers, General Electric Co., Pittsfield, Mass., and L. R. Spann, Eastern Malleable Iron Co., Naugatuck, Conn., offered some remarks.

Mr. Rubovitz said that gray iron and processed cast iron appear to be the most favorable pattern material for production work since they give the desired smoothness of surface,

(*Concluded on page* 310)

Another CHROMALOX Production Tip

ELECTRIC HEAT UNIFORMLY DRIES LADLE LINERS



Ladle Drying of the refractory-water-mix liner is done uniformly with electric heat.

PROBLEM

Dry liners quickly and get ladles back into use; reduce rejects due to the uneven drying of the manually operated gasoline torch method on ladle liners; reduce the high man-hour cost of drying each of the ladle linings; make work area more comfortable.

SOLUTION

A standard, flange type Chromalox Electric Heater was mounted in a lifting lid and lowered into the ladle as heat was required. A small blower was installed to force air through ladle; another small tubular heater was installed in spout to do the same job.

ADVANTAGES

Automatic temperature controls assure even heat on all parts of the liner. Guesswork is eliminated, and exactly the right amount of heat is forced into the liner as required to dry it thoroughly. "By-product" advantages include the elimination of the hazards of open flame drying and cleaner, more comfortable working area.

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Electric Heat for Modern Foundries

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ACME RESIN

1 MULLING, tacky stage. Cold sand, liquid resin, and catalyst are charged into a standard muller.

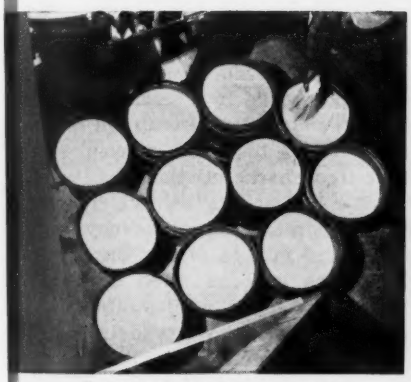
2 MULLING, free-flowing stage. Each grain of sand *uniformly coated* —no critical control necessary.

3 DISCHARGING. Sand is *dust-free*, cannot segregate from resin, green strength is controllable.

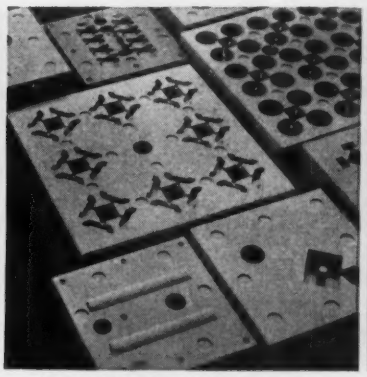
4 TWENTY-POWER magnificat of resin-coated grains of s after mulling process.

PlastiSand PROCESS

Resin formulation and the coating process covered by Patents Pending



5 COATED SAND, ready for use. Extremely *high tensile strength* at resin contents of from 2% to 4%.



6 BLOWN SHELL CORES. *Non-segregating* qualities lend themselves perfectly to shell and core blowing techniques.

7 STACK POURING of Alnico magnets, 12 to 16 high. 2% of resin produces necessary *high strength*, saves time and space.

8 SHAKE OUT—good collapsib ity makes for easier shake o and better cleanup.

Pictures courtesy Mr. Raymond Kelly, Superintendent, Arnold Engineering Foundry, Marengo, Ill.

PLASTISAND Process utilizes a revolutionary new method for coating sand with liquid-resin for foundry shell molding.

This new development by Acme Resin Corporation in the field of shell molding has several positive advantages that overcome the primary deterrents to the use of the more widespread "C" or shell molding process.

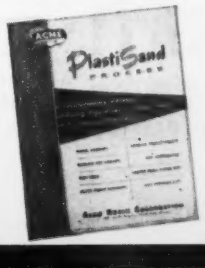
Foundries using the PLASTISAND Process report PROVED SAVINGS, PROVED SAFETY and PROVED SUPERIORITY of molds with as little as one-half the resin content formerly necessary with dry resin.

With the PLASTISAND Process, a shorter dwell is possible and a faster cure is assured, from a shorter time on the pattern and a faster baking cycle.

Acme's new PLASTISAND Process is adaptable to dump-box, roll-over and blowing of either shells or cores. It uses either hot or cold mulling—in both, Acme liquid resin is used.

SEE THE PLASTISAND Process for yourself at the FOUNDRY SHOW in Cleveland, Ohio, MAY 8-14. Drop in to SPACE 1334.

An informative folder has been prepared to better acquaint the foundry industry with the new PLASTISAND Process. It may be obtained by writing to the ACME RESIN Corporation at the address listed here.



ACME RESIN CORPORATION

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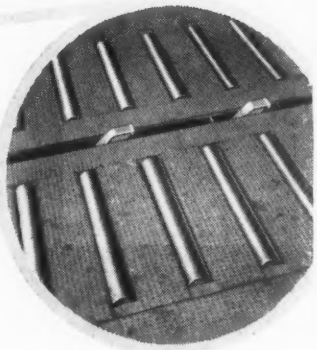
20,000 lb. Molds Now Handled Easily!

with an ALVEY-FERGUSON Engineered Conveying System



IN THIS modern foundry, heavy molds weighing from 15,000 to 20,000 lbs. are handled easily on an Alvey-Ferguson Heavy Duty Roller Conveying System with an air operated reciprocating pusher between the two lines of rollers. (See inset photo)

For handling molds, flasks and sand in *your* foundry a completely co-ordinated Conveying System engineered by Alvey-Ferguson will reduce worker's fatigue, lessen breakage, increase efficiency and production in the same space—and therefore reduce costs . . . An Alvey-Ferguson *Engineered* Conveying System quickly *pays for itself in savings!*

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For a discussion of latest efficient handling methods—write today.

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SINCE 1901 . . . FIRST IN PRODUCTS HANDLING EQUIPMENT

(*Concluded from page* 308)

and possess good heat capacity. Brass or bronze can be used, but are subject to nicking and marring. Aluminum alloys tend to warp and cause sticking of the shells, and also become coated with a carbonaceous film which has to be removed from time to time. Fully machined patterns are desirable, and a raised frame about ¾-in. wide outside the pattern area and the same dimension of the dump box opening helps in eliminating "peel-back."

Mr. Spann asked whether the problems of scabbing, warping, shifts, etc., have been solved, and if there still is as much interest displayed by castings' consumers in the process. Mr. Curry in reply said that the problems mentioned usually are not encountered if the pilot work is carried out properly. As to consumer interest, his opinion was that if anything it is greater than before; but, unfortunately, foundries are lagging far behind in trying to satisfy that interest.

Mr. Somers described some tests employed to ascertain the properties of resins for shell molding. He pointed out that melting point of the resin is related to release or draw time of the shell. If it is low, the resin will melt too soon; if high, it will not melt soon enough and slow down operations. While some adjustment can be made by decreasing or increasing the pattern temperature, it is advisable to obtain a resin with the desired characteristics.

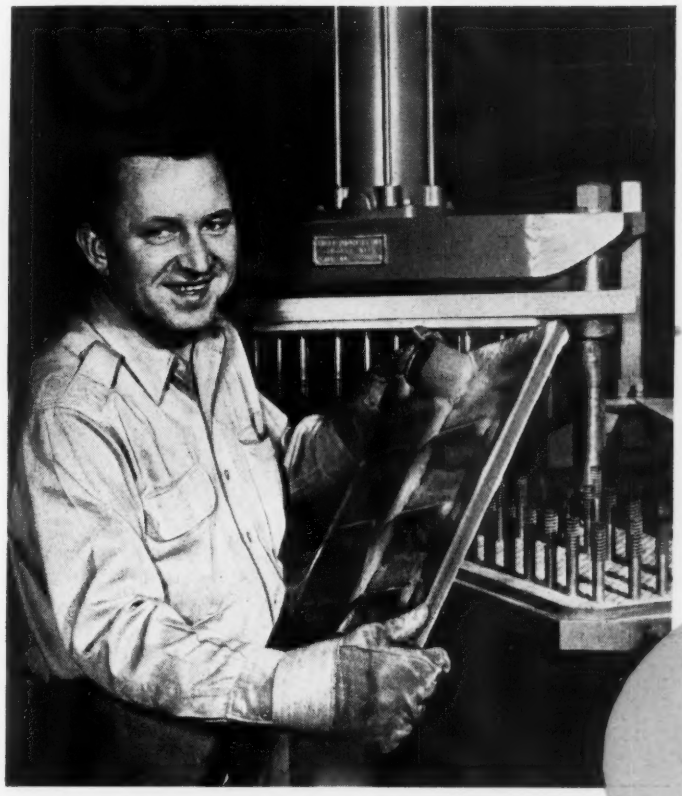
Another is a hot rigidity test which gives information on the tendency of the resin-sand mix to distort during stripping as well as swell and distort when in contact with molten metal. To indicate the spreading ability of resin, especially with the type used as adhesives to fasten molds together, a definite amount of resin is placed on a hotplate heated to 150° C (302° F) and covered with a piece of filter paper on which a weight is placed. The resin is absorbed by the filter paper, and measurement of the diameter of the spot gives information on the spreading quality of the resin.

Foundry Makes Own Film

Smith Steel Casting Co., Marshall, Tex., is making use of colored motion pictures to tell the story of its expanding facilities to the industrial Southwest. The film was made in the plant by the company and is designed to show various foundry operations so that business and civic leaders can obtain a clearer understanding and better appreciation of the company's operations.

Here's how General Electric Shell Molding Resins and a new bonding machine CUT FINISHING COSTS UP TO 50%

CUT PRODUCTION TIME 56%



Reduced finishing costs up to 50% are being realized by Merrow Machine Company, Hartford, Conn., on yokes shell-molded by Production Pattern & Foundry Company, Chicopee, Mass. General Electric resins are used both to make the shell halves themselves and to seal them together on a new bonding machine, developed by Shell Process, Inc., which makes pouring without backup possible.

Merrow reports that the fine finish of the shell-molded castings reduces finishing costs up to 50%! Appearance is vastly superior to that obtained by conventional sand-casting methods.

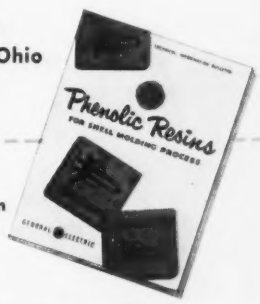
Production Pattern reports that fast-curing G-E shell resins on the molding machine and a special resin on the new bonding machine cut casting production time by 56%! A single operator can produce the shell halves and join them in a continuous cycle. G-E resins impart good hot rigidity to shells, resulting in low warpage, intimate sealing and close tolerances with low finning; high strength for good reproductivity and minimum metal reaction.

You can put your confidence in

GENERAL ELECTRIC

General Electric, makers of molding and bonding resins, and a silicone parting agent for the shell process, would like to tell you more about the cost-cutting possibilities of this new foundry technique. *Just mail the coupon for technical data!*

Be sure to visit us at the
Foundry Show, May 8-14
Public Auditorium, Cleveland, Ohio
G-E Booths 1518 & 1621!



General Electric Company
Section 1418-1A, Chemical Division
Pittsfield, Massachusetts

Please send me free technical data on:

( ) G-E phenolic shell resin (medium cure)
( ) G-E phenolic shell resin (fast cure)
( ) SM-55 silicone parting agent

I want this for: ( ) Reference purposes only ( ) An immediate application on_____

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KOPESEAL

a new, soft extruded bead sealer that replaces mud or dough rolls for cope and drag sealing

Photo courtesy of The Cooper Alloy Foundry Co.

- *Ready to use, saves labor*
- *Assures proper cope seating*
- *Prevents run-outs*
- *Measures and maintains metal thickness*

- **More pliable and workable, easy to handle and apply.**
- **Completely dissipates when casting is poured.**
- **Gives off no gas, a cause of blow holes.**
- **Non-toxic and non-irritating to the skin.**
- **Non-oxidizing and non-hardening; indefinite shelf life.**
- **Equally effective on any size mold.**
- **Foundry-tested . . . proven superior to and more economical than any other method of cope and drag sealing.**

KOPESEAL is an exclusive development of Presstite Engineering Co., the leading manufacturer of sealing compounds for American industry since 1924.

KOPESEAL is a permanently soft heavy mastic compound extruded and furnished in bead or rope-like form. It is made of special non-hardening synthetic resins and other inert modifiers, with asbestos fiber binder. Does all the jobs now done by mud or dough rolls and does them better. Eliminates all the time and trouble required in preparation.

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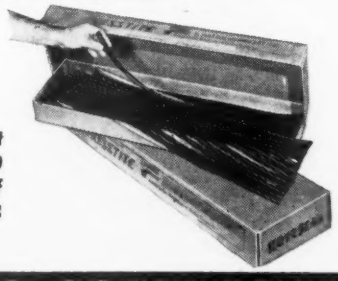

KOPESEAL is furnished in flat pack cartons, in lengths of 30 inches and diameters of 3/16, 1/4, 3/8, 1/2, 5/8 and 3/4 inches.

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Factors in Quoting on Aluminum Castings

By E. CARRINGTON

A number of factors must be considered by the aluminum foundry in preparing to quote a price to a buyer of castings.

Quantity—Will the order complete customer's requirements or will there be repeat orders? If the volume is sufficient the job may be considered as a permanent mold or die casting instead of a sand casting. The foundryman is in a position to decide whether or not it is worth while to make several patterns, also on the material, type and construction of the patterns.

If only one or a small number of castings are ordered, a cheap wood pattern will serve. If more are required a good quality wood pattern is justified. For a great number of castings unsuitable for a permanent mold, one or more metal patterns would be proper. For a running job order entailing definite daily, weekly or monthly delivery, infrequent pattern changing will mean lower overhead and lower production cost. If a permanent mold is the choice, the adoption of sand cores or expensive many-part steel cores will depend to some extent on the number of castings required.

Alloy — Aluminum foundry alloys vary from the high-strength, heat-treatable alloys to nondescript alloys consisting simply of remelted scrap of unknown composition. Some of the high-strength alloys are difficult to cast, and certain ones require special foundry technique which increases the cost of production. Some medium strength alloys require heat treatment and some do not. Some have excellent castability and good ductility if treated properly before pouring. Certain alloys are unsuitable for use in permanent molds.

Interchange of information between foundry and customer usually is beneficial. For example, it may be possible to suggest that the alloy requested by the customer would not withstand corrosive conditions described as well as another alloy. In a similar manner advice on anodability, machinability or electrical conductivity might save the customer much disappointment.

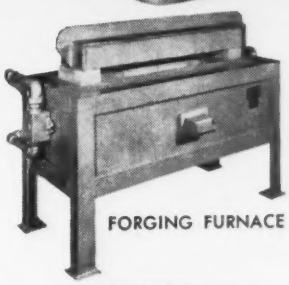
Machining — Machined areas generally are shown on the drawing, but it is well to examine and check on this feature. To insure soundness and a good machined surface on a

(*Continued on page* 316)

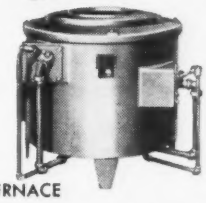
get the best out of your tool steel through

PROPER DRESSING

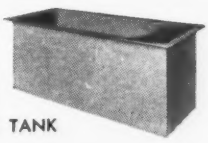
FORGING HAMMER



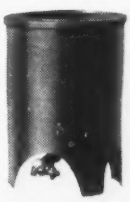
FORGING FURNACE



POT FURNACE



QUENCH TANK



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TOOL GRINDER

Here is a "Package" that will get rid of a costly and annoying problem . . . In fact, it will save up to 60% of costs for cutting and chipping tools . . . the best life is gotten out of today's steels through proper dressing . . . proper steel; properly treated, will reduce costs substantially. Now, at your own convenience, you can dress as many tools as are needed, and keep close control of your tool inventory.

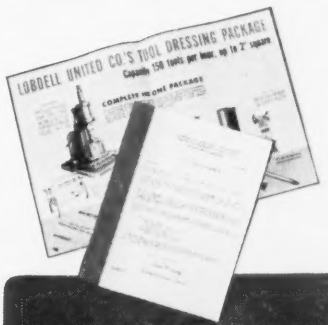
The complete "Tool Dressing Package", entirely engineered by LOBDELL UNITED CO., (subsidiary of United Engineering and Foundry Co.) . . . includes all of the Forging, Heat Treating and Dressing Equipment . . . plus, the practical methods needed . . . and this "Package" not only reduces inventory costs, but it can do this at *low initial* cost, recoverable nominally in one year . . . without special metallurgical control.

The "versatile" NAZEL Electro-Pneumatic Forging Hammer is the LOBDELL UNITED CO. product . . . For the additional equipment presented within this "Package", LOBDELL is joined by a group of the most reputable leaders in their fields:

Heating Equipment by Eclipse Fuel Engineering Company

Tool Grinding Equipment by Black and Decker Company

Accessory Tools and Tool Steels by Bedford Tool and Forge Company



A copy of LOBDELL's new "Tool Dressing Package" Bulletin will give you further details.

"See us at Booth 1605, Foundry Convention, Cleveland, May 8-14"

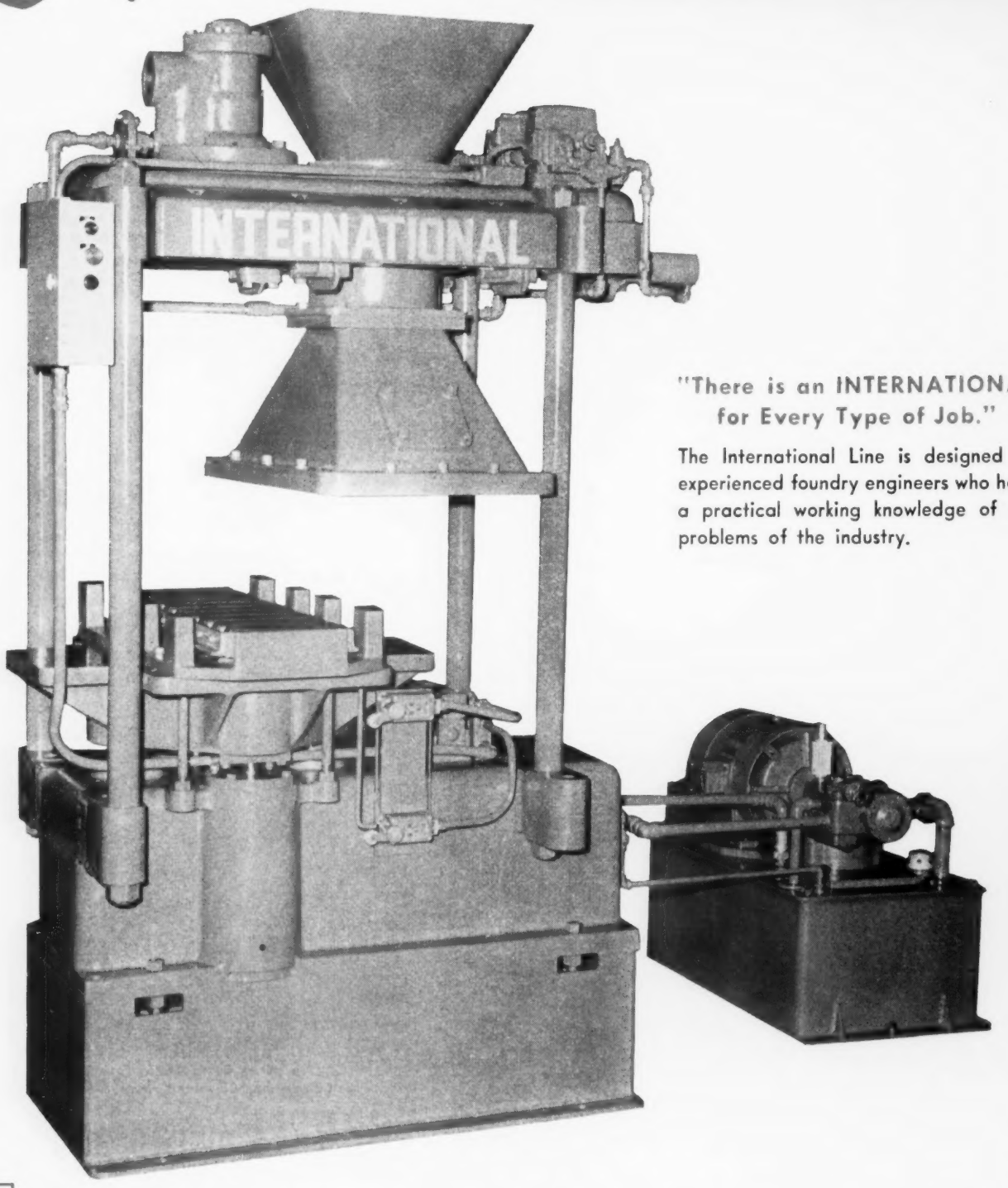
LOBDELL UNITED COMPANY

1836-1954 WILMINGTON 99, DELAWARE

A SUBSIDIARY OF UNITED ENGINEERING AND FOUNDRY COMPANY

FOUNDRYMEN—here are the Sand Blowers you asked for..

INTERNATIONAL'S *New* SB13CH



"There is an INTERNATIONAL for Every Type of Job."

The International Line is designed by experienced foundry engineers who have a practical working knowledge of the problems of the industry.

INTERNATIONAL

SB13C SAND BLOWERS

Here are the Sand Blowers with all of the new features you have asked for—flexibility . . . simple design . . . ease of maintenance . . . faster operation . . . more positive action!

• The new SB13CH Sand Blower pictured on the opposite page is adaptable for cores up to 75 pounds • 10" throat opening for easy loading • Sand carriage rails and bearings completely shielded from sand • New-type exhaust valves • Sand carriage operated by a two-way pneumatic cushioned cylinder, trunnion-mounted for sure action — no springs • Two tandem-mounted hydraulic clamp and draw cylinders with two large chrome-plated guides provide positive clamping and accurate draw • Four support posts are movable for operations where side loading is desired • Draw table available with or without rollers • Completely electric automatic cycle control can be timed to the fastest or slowest jobs • Hand operated cycle control also available, if desired • Sub-bases available in heights to meet conveyor requirements (optional equipment).

TYPE SB13C MACHINE

The SB13C has the same capacity and dimensions as the SB13CH, but the clamp and draw cylinder is pneumatically operated.

MOLDING MACHINE CO. LA GRANGE PARK, ILLINOIS

(*Continued from page* 313)

sand casting, the machined area generally is placed at the bottom of the mold. If this is considered highly important, it may be necessary to provide a core hanging from the cope. This will increase the molding cost.

Heat Treatment—This will affect the cost to a considerable extent, but heat treatment is connected closely with other considerations. A heat-treatable alloy would not be used for die castings. As a general statement heat-treatable alloys are not easy to cast. In certain instances it may be found preferable to use a non-heat-treatable alloy and give the casting a slightly thicker section.

If the castings are to be inspected and released by a service department, the chemical, physical and x-ray tests involved will make a considerable difference in the quoted price. They also probably will delay delivery of the castings. Where the order or inquiry simply specifies *castings*, it is necessary to secure from the customer as much information as possible. If a particular process is specified and that process is unsuitable because of the number required, the size, complicated shape or the unsuitability of the alloy, or for any other reason, further information is necessary.

Sometimes with a minor change or two the casting may be made more cheaply. This should be directed to the customer's attention before a quotation is submitted.

Is The Order Wanted?—This may seem a rather silly question after all the foregoing points have been duly considered. The answer is not sure to be "Yes." Reasons for a negative answer may not be obvious until the inquiry has received full consideration. For example, the foundry would like to accept the job, but it is a sand casting suitable for production on one kind of molding machine. These machines will be fully occupied for a considerable time. The foundry has no option but to decline the order.

Some customers would like to have their castings machined by the foundry accepting the order. The foundry may have the necessary casting facilities, but the machine shop capacity may be inadequate. Similarly, where a number of castings demand different heat treatment, it might be a long time before the castings under consideration could be put through the heat treatment cycle.

Many foundrymen wish to enlarge their experience and knowledge by taking on a proportion of difficult jobs. This ensures that each worker has a keen interest in his work. Gradually a constantly improving foundry technique is built up, based to some extent on mistakes but increasing familiarity with difficult alloys and difficult processes.

There is an economic limit to acceptance of difficult jobs. Plenty of time and ample room must be left for the bread and butter jobs which present few molding or casting difficulties. In addition, there is a psychological objection to accepting orders for too many difficult jobs. Members of the foundry staff constantly will have to live with them and give them too much attention, thus neglecting the jobs upon which the foundry depends for continued prosperity.

Quotation Sheet — After proper consideration of all essential features, each quotation should be written out on a quotation sheet, which is filed. The figures may be compared later with the actual cost. Certain estimates may not be correct. Where the records are available, they may be altered on subsequent quotations. The quotation thus gradually will become more accurate. A suggested quotation sheet is shown here. It may need modification to meet a foundry's special need.

Customer .....

QUOTATION

Name of Part .....Date .....
Die or Pattern No. ..... Dwg. No.....
Description .....
Alloy .....Weight .... Spec.....
Quantity .....

METAL:
..... lb at ..... per lb ———
Less....lb scrap at....per lb ———
Heat treatment at.....per lb ———
———
———

LABOR:
Molding .....
Coremaking .....
Rough cleaning .....
Finishing ..... ———
Bonus % .....
Working expense % .....
Inspection and reject % ..... ———
———
Total cost ———
Cost per lb ———
Polishing .....Quoted by.....
Machining .....Quoted by.....
.....Quoted by.....

DIE or PATTERN MATERIAL:
Total ———
Labor .....
Bonus % .....
Working expense % ..... ———
Total Cost ..... ———
Outside quotation by .....
Delivery date .....

Total metal as shown in the first item includes gates, sprues, runners and risers, spillings and skimmings. The weight of runners and risers for an aluminum alloy casting is approximately the same as that of the casting. For estimating purpose the weight of a casting may be obtained by weighing a sample casting, by weighing the pattern and calculating the relative densities of pattern and casting, or by calculating the total volume and finding the weight from the known density of the metal.

The second item, the scrap figure, is the difference between the weight

(*Continued on page* 318)

Lead in Cupola Scrap Does Not Harm Castings

By R. W. MILLER
Freiberg, Germany

THE cupola operator in a large German foundry observed heavy white smoke emerging from the taphole. Closer examination showed the spout to be covered with a fine, yellowish-brown, powdery crust emanating from the smoke. A search revealed that some of the scrap used in the charge included heavy cast iron counterweights, but no one suspected that they contained lead.

However, the smoke and the efflorescence did indicate its presence, which later was confirmed when the sand bottom in the forehearth was removed in preparation for the next heat, and a

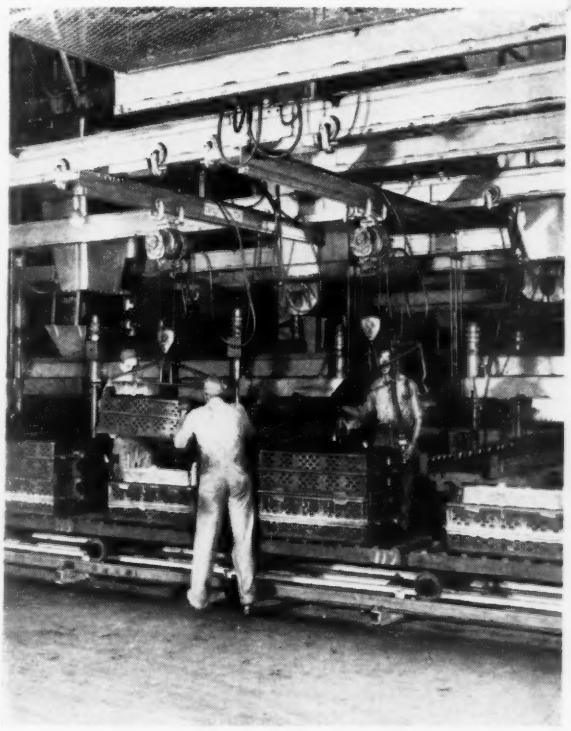
thin sheet of lead about ⅛-in. thick was found between the sand and brickwork of the forehearth. The sheet of lead, considerably deformed in removal, is shown in the accompanying illustration. Fortunately, since lead does not alloy with iron, no difficulty was encountered with castings poured from the heat.

USE MONORAIL CRANES

. . . Where Space is Limited

. . . To Handle Variable Jobs

. . . For Low Maintenance Cost



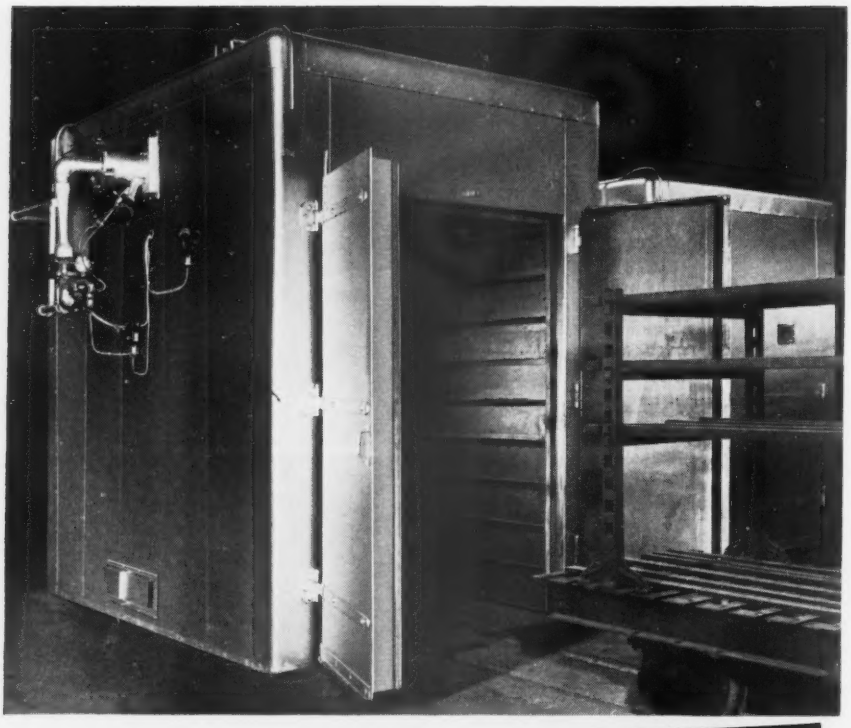
These are just a few reasons why American MonoRail Cranes are gaining in popularity and are being installed in increasing numbers of plants the country over. Call in your American MonoRail representative and have him tell you all the advantages of MonoRail Cranes such as—ease of handling—smooth travel—strength—safety interlocks—power operation and **interlocking carrier service between and beyond the craneways.** Consultation in connection with any handling problem is available without obligation.

Send for your copy of C-1 Bulletin

AMERICAN OVERHEAD HANDLING EQUIPMENT

MONORAIL COMPANY

13104 ATHENS AVENUE • CLEVELAND 7, OHIO



KILN TYPE OVENS

With The Custom Features You Want Most

NOW— At Standard Model Low Prices

Here is a new line of MOCO Standard Ovens for job lot production. These ovens are engineered for baking, heating, drying, curing—using gas heat or electricity.

Custom features, not ordinarily found in standard ovens, have been built in. Result: HIGH HEAT UNIFORMITY, giving you a quality oven product with savings in time and money.

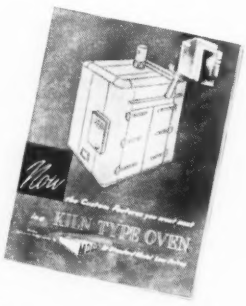
Immediate pricing and specifications of this low-cost unit are available. Delivery is prompt.

Complete installation instructions are provided and technical assistance is available.

MICHIGAN OVEN COMPANY DETROIT MICHIGAN MOCO

WRITE TODAY

Send for this Standard Oven Folder today and get all the facts on this modern concept of production heating.



MICHIGAN OVEN COMPANY

415 BRAINARD, DETROIT 1, MICHIGAN

(*Continued from page* 316)

of the metal required and that of the casting. On shop or return scrap used on the following day, the price could be the same as that of the original metal. If it is used for permanent mold castings it may pick up iron or deteriorate in some other way. While it still would be suitable for those castings, it might not be acceptable for certain other castings. In that case a lower figure should be used for the scrap price to take care of that devaluation.

Cost of heat treatment depends on whether the high-temperature, the low-temperature or the double treatment is given. Method of allocating cost varies from foundry to foundry. It may be based on the cost per hour, or on an average for each treatment. The charge will be a fixed amount per pound.

Cost Per Pound—Includes the cost of handling and melting the metal. It will vary with the cost of power and fuel and with wages.

Rough molding cost may be based on the volume of sand rammed per hour. Volume of the flask is known, and hence the cost per mold. This method would not apply to every type of mold. To the ramming cost must be added the cost of making and setting the cores.

Rough cleaning indicates the removal of runners and risers. Finishing indicates the final operations with files, grinding wheels, etc. Costs might be kept separate or lumped together. Bonus includes addition to regular wages. Figures for overhead depend on the proportion of nonproductive labor, maintenance, taxes, rent, etc., and at first will have to be estimated by the cost department. After some time actual figures become available and may be altered occasionally to meet changed conditions.

Inspection and reject charges will vary widely. With simple permanent mold castings this item may be as low as 1 per cent. With a large complicated sand casting there are many risks of something going wrong, especially with the first few castings. If only two or three castings are required, the scrap figure easily might reach 33 per cent. This possibility should be allowed for in the quotation. Surely it is much better to quote a high price and lose the order than to quote a price too low and work at a loss because of high scrap.

Space is provided for the cost per casting and the cost per pound. Many customers want to know the

(*Continued on page* 320)

MORE HP PER POUND • MORE HP PER CU. IN. • MORE HP PER DOLLAR

190,000 STANDARD *Stock* ANSWERS TO *Your* DRIVE PROBLEMS

Look closely at the cutaway views above. Note how the worm wraps around the gear and the gear around the worm. That's the double-enveloping principle of Cone-Drive gears. It gives you high load-carrying capacity, long life and less weight, all in an extremely compact unit.

Size for size, Cone-Drive speed reducers will out-perform any other worm geared speed reducer on the market.

Yet, you can select any one of 190,000 standard stock reducers to solve your specific drive problem the efficient way.

You can choose ratios from 5:1 to 4900:1.

You can handle loads from fractional to 800 hp.

You get all this with only 58 standardized mountings.

Cone-Drive gears offers this versatility because of their modern manufacturing methods. All parts for a given center distance—gears, mountings, bearings, housings, fan-cooling attachments and water cooling coils, etc.—are standardized whether you require worm under or over, gear shaft vertical or horizontal, single or double-extended shafts, right or left hand. All of these parts are completely interchangeable for a given center distance, too.

Find out more about Cone-Drive speed reducers. Ask for Bulletin 8901-50.

CONE-DRIVE GEARS

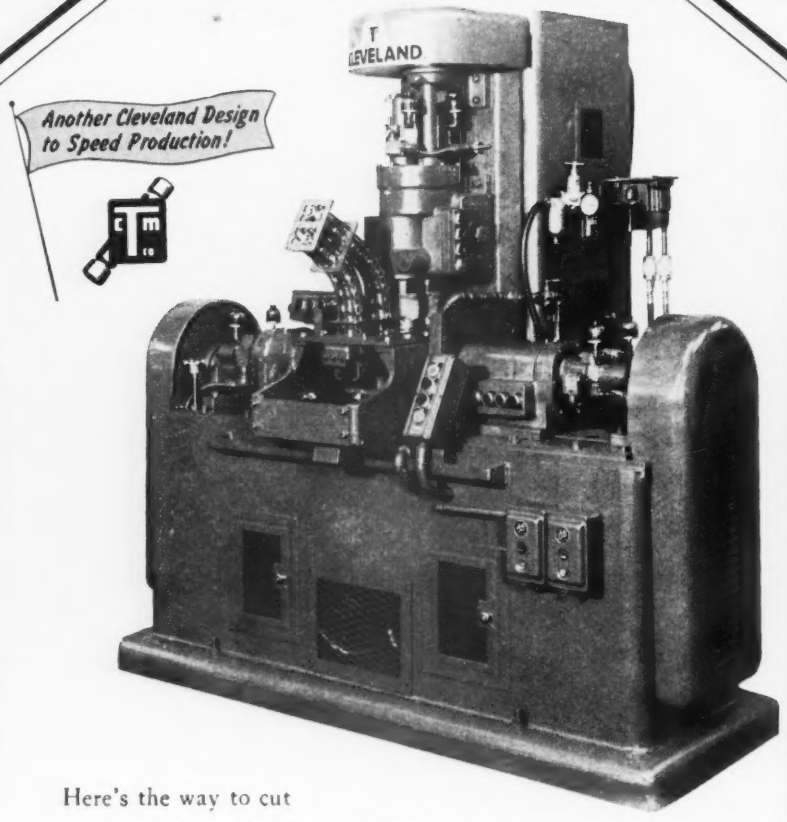
Division, Michigan Tool Company

DOUBLE ENVELOPING GEAR SETS & SPEED REDUCERS

7171 E. McNichols Road • Detroit 12, Michigan

SEE OUR EXHIBIT AT THE FOUNDRY SHOW BOOTH #1608

1308 tee fittings per hour!



Here's the way to cut costs on tee fittings! This Model FT-1 will tap 1308 pieces ½" - 14 per hour at 100% efficiency. Also handles ¾" and 1" sizes. All spindles have their own lead screw feed—assuring the precision for which Cleveland Fitting Machines are famous. Produced parts are square and within the required tolerances. Set-up and change-over time is reduced and tap life increased up to 25%. For greater efficiency this Model may be grouped in batteries of three with one operator to each battery.

If you make fittings of any size or type it will pay you to consult Cleveland engineers. Their know-how can save you money.

Write today for Catalog No. **FD-54.**

THE CLEVELAND TAPPING MACHINE CO.

A Subsidiary of **AUTOMATIC STEEL PRODUCTS, INC.**

CANTON 6, OHIO

For Better Tapping - - Faster!

CLEVELAND *lead screw* **fittings machines**

(*Continued from page* 318)

cost of building a finished product. They want the cost of each item. Cost per pound is of no interest. Some customers want the cost per pound, and then wonder why one casting costs more per pound than another. It will be necessary tactfully to explain that labor costs as well as metal costs affect the price. A light complicated casting easily could cost more per pound than a heavier more simple casting.

Cost of finishing, machining, polishing, etc., will be estimated by men in charge. If the work is done outside, estimates will be furnished by firms doing the work.

Pattern and Die Quotation—A full description of all the materials, also the amount required is entered under *Materials.* Since the overhead costs of pattern shop and toolroom differ materially from those of the foundry they should be kept separate. If outside firms submit quotations for pattern or die, their figures should be entered on the quotation sheet. A copy of the quotation sheet with a figure to cover profit will be sent to the main office.

Delivery Date—This is highly important. One foundry may promise delivery on the 6th and delivers on the 7th. Another foundry promises delivery on the 8th and delivers on the 7th. Reaction of the customer will be vastly different in the two cases. He may have prepared for the machining of the castings, therefore delivery when promised is far more important than speedy delivery, provided it is not delayed too far. Obviously, the way to set a delivery date would be to determine the estimated time for each process, then add all together.

Sometimes a customer wishes to get on with a job quickly and to develop it as he goes along. The foundry can help by doing the work in stages, each stage marking a speeding up in production and a slight development in the casting design. The first casting envisaged by the customer is a combination of sevral built-up experimental parts, is a rough sand casting made from a cheap wood pattern with extra machining allowance.

Later a better pattern carries little machining allowance and many castings are made. The customer makes slight modifications and orders large quantities of castings. The foundry suggests modifications which simplify the molding and casting process. After final ap-

(*Concluded on page* 322)

pioneering developments keep **DUSTUBE**® *first in dust control*

Why 5 Tons of Electric Furnace Fume Did Not Settle In Chicago This Week

High Efficiency Dustube® Collector Solves Air Pollution Problem

Instead of dispersing into the Chicago atmosphere, five tons of very fine dust and fume are now trapped weekly in this Dustube Dust Collector. That is how one progressive Chicago steel foundry is eliminating air pollution from its two 5-ton electric steel melting furnaces.

After a wet washing system proved ineffective in controlling the dense smoke and fume this foundry, recognizing the efficiency of cloth filtration, installed a Dustube Collector. This unit, handling 20,000 cfm of gas is equipped with tubular Orlon bags with a mechanized shaking device. Conventional hooding over the two furnaces was not feasible due to their use of a turntable and a single set of electrodes. Therefore, the foundry retained a consultant who designed the swivel type overhead hood, shown in the illustration.

Only filtration can be depended upon to yield an effluent gas free from visible solids. And, the modern Dustube Collector with its highly efficient shaking method and unique cell plate design has proved beyond a doubt that electric furnace fume control need not be a problem any longer.

If you want dust or fume collection that is thorough, yet economical . . . that will pay its own way . . . investigate the Dustube today. Send for Catalog 372.

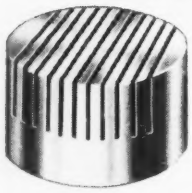
Write for your copy of Catalog 372 today.

American
WHEELABRATOR & EQUIPMENT CORP.
505 S. Byrkit St., Mishawaka, Indiana

dustube ®
COLLECTORS

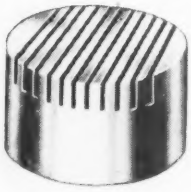
SMILLIE
CORE BOX VENTS
"A Specific Type for Every Core Box"

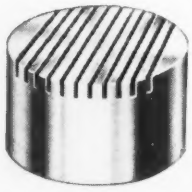
Slotted



X-TRA DEEP HEAD
.156
Wide Slots
.014

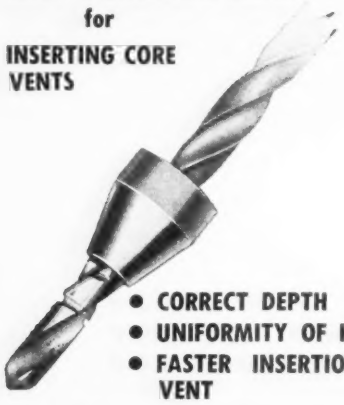
DEEP HEAD
.093
Wide or Narrow Slots
.014 .010





SHALLOW HEAD
.031
Wide or Narrow Slots
.014 .010

INSERTING DRILL
MOST ECONOMICAL METHOD
for
INSERTING CORE VENTS



- CORRECT DEPTH
- UNIFORMITY OF HOLES
- FASTER INSERTION OF VENT

VENT CLEANER
FOR CLEANING SLOTS
- MADE OF TEMPERED STEEL
- EASY TO USE

MANUFACTURERS OF PRECISION TOOLS-GAGES-FIXTURES MACHINED-GROUND PARTS

C.M. SMILLIE & CO.
1124 WOODWARD HGTS., FERNDALE 20, MICH.

(*Concluded from page* 320)

proval a metal pattern is made and a large number of castings are produced. The customer is satisfied, but wants still greater volume of castings. A permanent mold is made to speed up production.

In this manner a constant supply of castings is provided while the customer is engaged in his development work. If the foundry is able and willing to co-operate in this way, the procedure should be fully considered at the quotation stage.

Aluminum Heat Treatment Discussed in Manual

Metallurgy involved in the heat treatment of aluminum alloys is covered in a 122-page, 6 x 9 in. pocket-size manual published by the Reynolds Metals Co. A simplified, nontechnical explanation of aluminum heat treating is presented in one section of the book, while another section is written for the metallurgist where full metallurgical details are presented.

Separate chapters are devoted to annealing, stabilizing, solution heat treatment, and aging or precipitation hardening. Furnaces, salt baths and other equipment also are discussed.

A glossary of terms and special photomicrographs are other features. Tabular time and temperature, mechanical property and technical processing data charts are included.

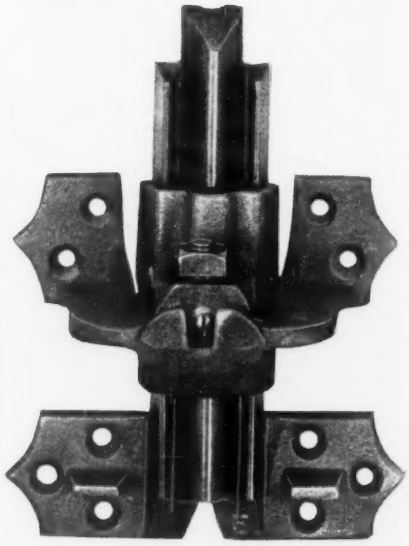
Copies of the manual will be sent free to engineers, metallurgists, instructors and technical men requesting it on company letterhead. To others, the price is $1 per copy. Address requests to Reynolds Metals Co., 2500 South Third St., Louisville, Ky.

Book Review

1953 *Supplement, Book of ASTM Standards, Part* 5, *Fuels, Petroleum, Aromatic Hydrocarbons, Engine Antifreezes*, paper, 332 pages, 6 x 9 in., published by the American Society for Testing Materials, 1916 Race St., Philadelphia 3.

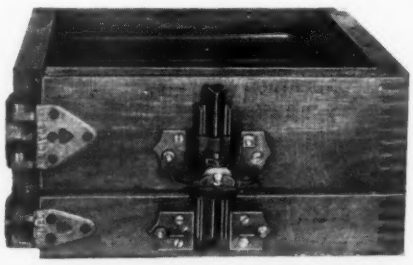
This 1953 supplement to Part 5 of the 1952 volume contains the revised standards and tentatives as well as new ones which have been accepted since the apperance of the latter. It contains 12 standards and 34 tentatives. Of the former 11 are replacements of existing standards while 17 of the tentatives are replacements and 16 are published for the first time. Yellow stickers for affixment in the 1952 book are included to direct attention to the various changes.

TRU-LIFT
FLASK GUIDES & PINS



& MATCH PLATE LUGS

TRU-LIFT Flask Guides and Match Plate Lugs are designed around a principle used by many production foundries for more than 30 years. This feature comprises a multiple of 3 V-Shaped projections on the pin surface, and 3 V-Shaped grooves on the sliding surfaces of the cope guides. Thus, with the use of TRU-LIFT you get a *straight vertical lifting of the cope,* and removal of the Match Plate, similarly. TRU-LIFT guides are simple to install . . . let us send you a trial set for your examination and use.



SATISFACTION GUARANTEED
or money refunded

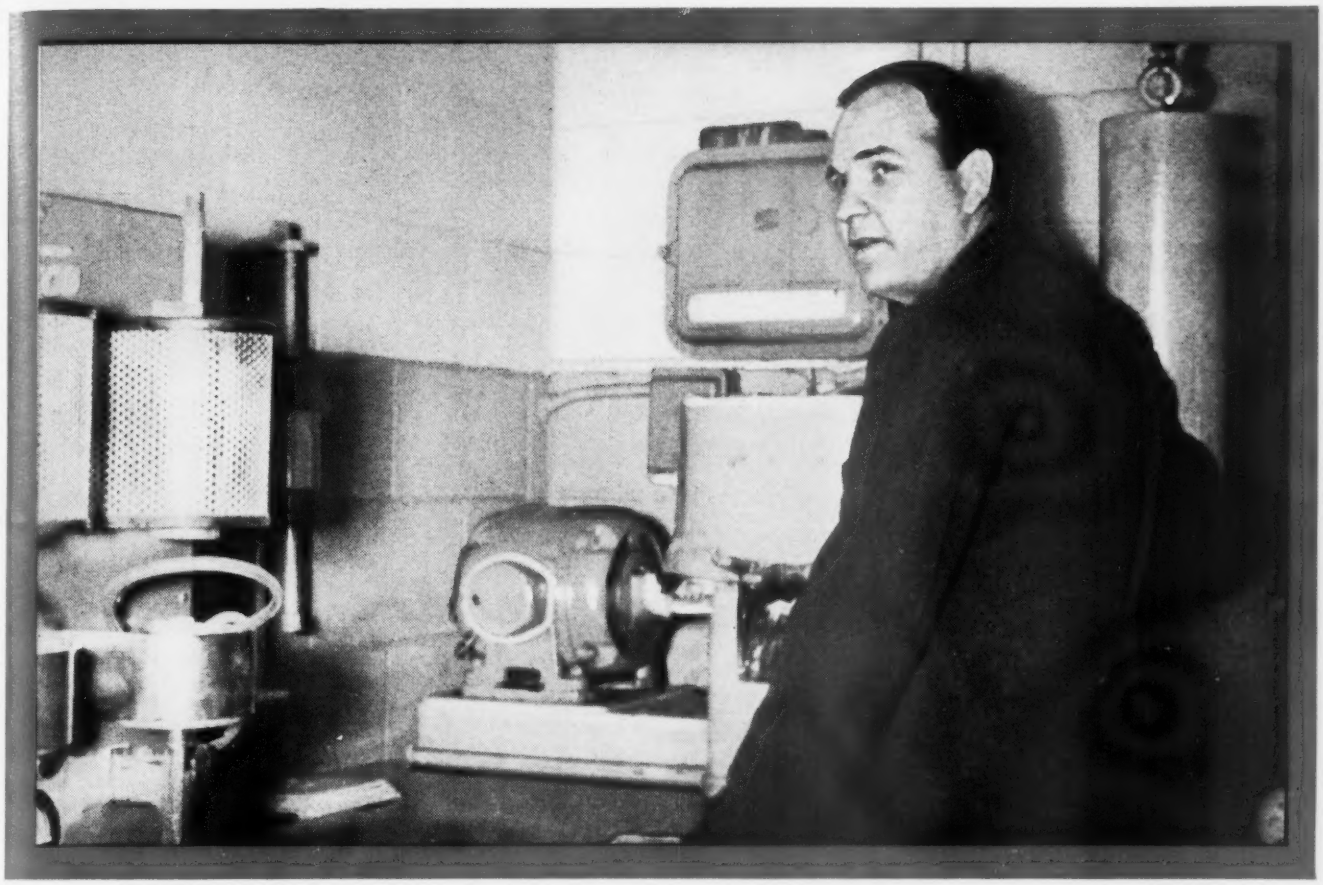
Specify **TRU-LIFT** to your favorite foundry supplier, or write direct.

MANUFACTURED BY
THE GOEHRINGER
FOUNDRY SUPPLY COMPANY
Manufacturers of foundry supplies, facings & equipment & refractory cements.

ACORN BRAND
919-21 W. 5th St.
Cincinnati 3, Ohio

(Advertisement)

Larry Emery, Chief Metallurgist, Marion Malleable Iron Works, in the laboratory where he developed his revolutionary new core binder formula last year.



Metallurgist's new core binder formula beats all others in 22 ways . . . thanks to PLASKON®

ALKYD RESIN

Marion Malleable Iron Works — makers of heavy castings for the railway and automotive industries —was having its full share of foundry headaches around this time last year. Heavy castings were showing cracks and tears. Binder waste, as well as casting losses, was uneconomically high. Employees complained that binder material being used had a sickening odor and irritated the skin.

Then Chief Metallurgist Larry Emery went to work—experimenting with a small order of PLASKON 580-11L Alkyd Synthetic Core Binder. Result: a core binder superior to all others ever used by Marion Malleable—in these 22 different ways—

1. Indefinite storage life 2. More uniform mix 3. No expensive release agents required 4. No skin irritations or objectionable odors 5. Lengthy air-drying has no effect on core quality 6. Cores do not need to be fogged 7. Baking time reduced 50% 8. Finer sands can be used 9. Overbaking does not affect cores 10. Moisture content of sand mix not a critical factor 11. Higher dimensional stability 12. Casting finish comparable to shell cores 13. Veining, rat-tails minimized 14. Lower resin-to-sand ratio 15. Elimination of wires in cores 16. Higher tensile and transverse strength 17. Less core breakage 18. Excellent collapsibility, fewer core butts 19. Uniform gas-evolution rate 20. Bentonites can be used with no strength loss 21. Sand can be reclaimed 22. Less binder needed.

Interested in Larry Emery's core binder formula? We'll be glad to supply it on written request. Also available without obligation, your PLASKON man's technical assistance and research facilities for the most efficient use of PLASKON products for industry.

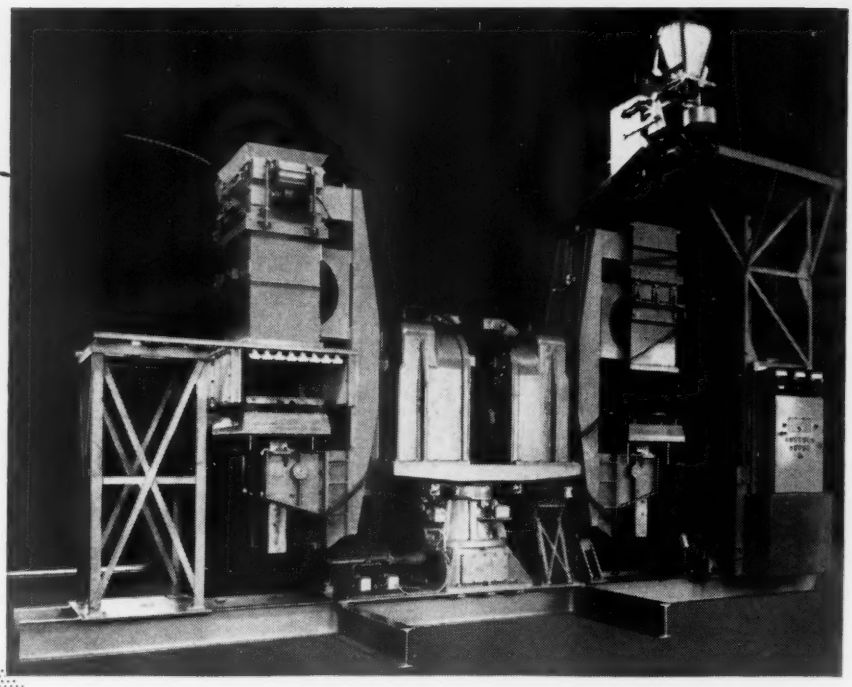
INVITATION

You are cordially invited to visit the Plaskon products exhibit in Booth 1909 at the 58th Annual Foundry Congress and Show, Cleveland, May 8 to 14.

For further information on PLASKON plastics and resins contact Barrett Division, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, N. Y. Whitehall 4-0800

Allied Chemical

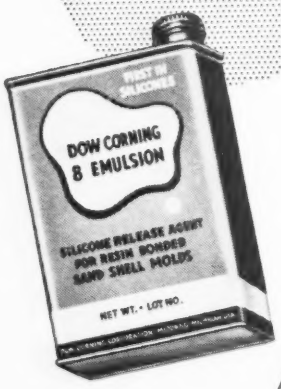
REDUCE SHELL MOLDING COSTS



One of the series of large size machines made by the Shell Mold Division, Beardsley & Piper, this shell mold machine features two pattern and dump box assemblies alternating on a rotary table between a fixed oven and a constant level sand-resin hopper. Quick pattern change-over, automatic oven time-temperature control and vertical sand-resin riffled rainfall are featured. Capable of handling patterns up to and beyond 30" x 40", it is available in single and multiple pattern units and in continuous rotary machines involving 10 or 12 heads or more.

specify DOW CORNING 8 EMULSION

...the Silicone Parting Agent that gives you clean, automatic release; helps assure fast, uninterrupted production



Whether you're using manual equipment or automatic machines, clean release is the key to dependably accurate shell molding at minimum cost. That's why you'll save money with Dow Corning 8 Emulsion. This non-corrosive, nonflammable silicone emulsion gives easy, positive release every time. It can't break down to form a carbonaceous deposit on even the most complex patterns. Cleaning costs are kept to a minimum because patterns stay cleaner longer. You also increase production of shells with consistently high dimensional accuracy.

Easily diluted in hard or soft water, Dow Corning 8 Emulsion is highly resistant to creaming or separating in storage or after dilution. Especially designed for the shell process, it is available at a new low price, 8% below that of previous emulsions. For more information and a free trial sample, write . . .

Send for sample TODAY

DOW CORNING CORPORATION, Dept. AH-17
Midland, Mich.

Please send me ☐ Free sample of Dow Corning 8 Emulsion
☐ Data on Silicone Release Agents for the Shell Process

Name _____

Company _____

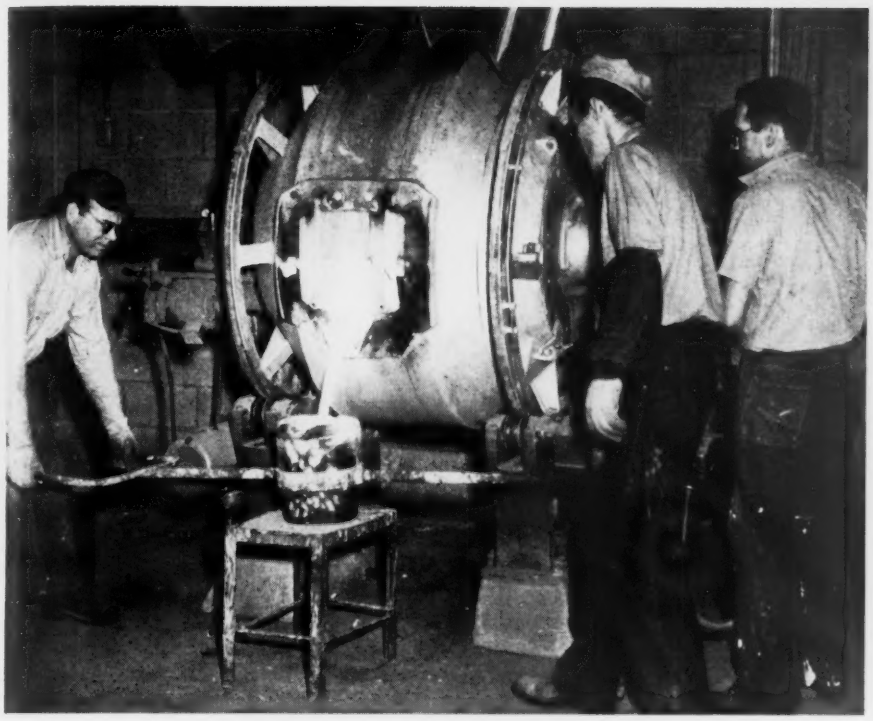
Street _____

City _____ Zone ___ State _____

DOW CORNING DOW CORNING SILICONES **CORPORATION**
MIDLAND MICHIGAN

ATLANTA CHICAGO CLEVELAND DALLAS DETROIT LOS ANGELES NEW YORK WASHINGTON, D.C. (Silver Spring, Md.)

Canada: Dow Corning Silicones Ltd., Toronto Great Britain: Midland Silicones Ltd., London France: St. Gobain, Paris



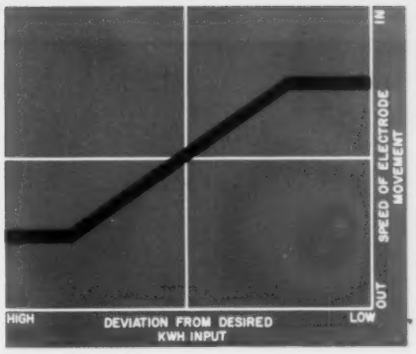


Fig. 1—Curve shows how magnetic amplifier control regulates speed of electrode adjustment, depending on the amount of adjustment required

Fig. 2—Heat radiated from arc produced between two horizontal electrodes melts charge in the rocking electric furnace

NEW ELECTRODE CONTROL

Cuts Operating Costs of Indirect Arc Furnaces

By H. F. ARNDT
Chief Engineer
Detroit Electric Furnace Division
Kuhlman Electric Co., Bay City, Mich.

and R. J. SONGER
Application Engineer
Clark Controller Co., Cleveland

SUBSTANTIAL savings in operating costs are indicated through use of a new magnetic amplifier arc control which the Detroit Electric Furnace Division of the Kuhlman Electric Co. is offering for use with its furnaces. Benefits observed in the limited tests conducted so far include reductions in melt time of approximately 15 per cent and in power consumption of about 5 per cent.

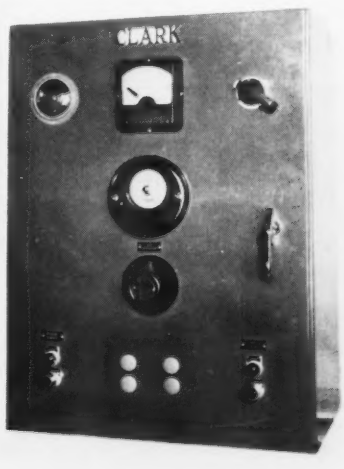
In the Detroit rocking electric furnace the charge is melted by heat radiated from an arc produced between two horizontal electrodes. The primary factor in controlling the power input to the furnace is the length of the arc, which is determined by the gap between the electrodes. Because an arc is inherently unstable, it is necessary continually to adjust the electrode gap in order to maintain a constant power input.

The furnace is equipped with one stationary and one movable electrode. Automatic positioning of the movable electrode to adjust for deviations from the desired input, is accomplished by means of the special magnetic amplifier control. This equipment was designed and built by the Clark Controller Co.

A small motor mounted on the electrode bracket provides the motive power to move the electrode out and in. Any variation in power input either above or below that determined by the setting of the arc current rheostat on the control panel shown in Fig. 3 causes the electrode to move out or in, so that the power input returns to the desired value.

If a small adjustment is required to maintain the desired power input, the motor runs at a low speed. If a large adjustment is needed, the motor runs at a high speed and slows down as the electrode approaches the

(*Concluded on page* 333)



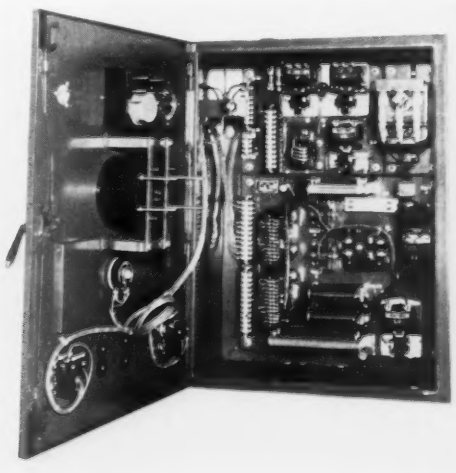


Fig. 3—At the left is a front view of the furnace control. On the right, an inside view of the control shows magnetic amplifier electrode control and contactors for the loss of voltage protection and rocking

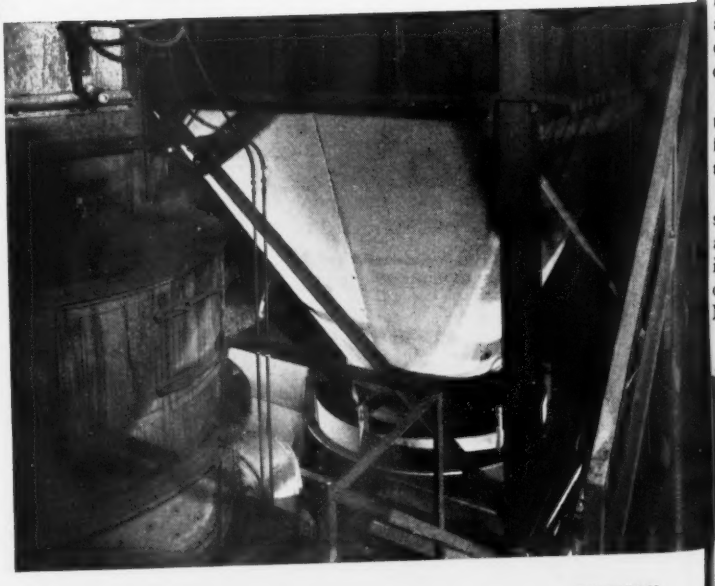
View from pouring floor shows specially designed molding hoppers of Stainclad Steel with air operated gates. The unique contour of these hoppers allows the extremely "sticky" steel foundry sand to flow easily. Also shown is the mold storage end of the Platen Car set-out track system.

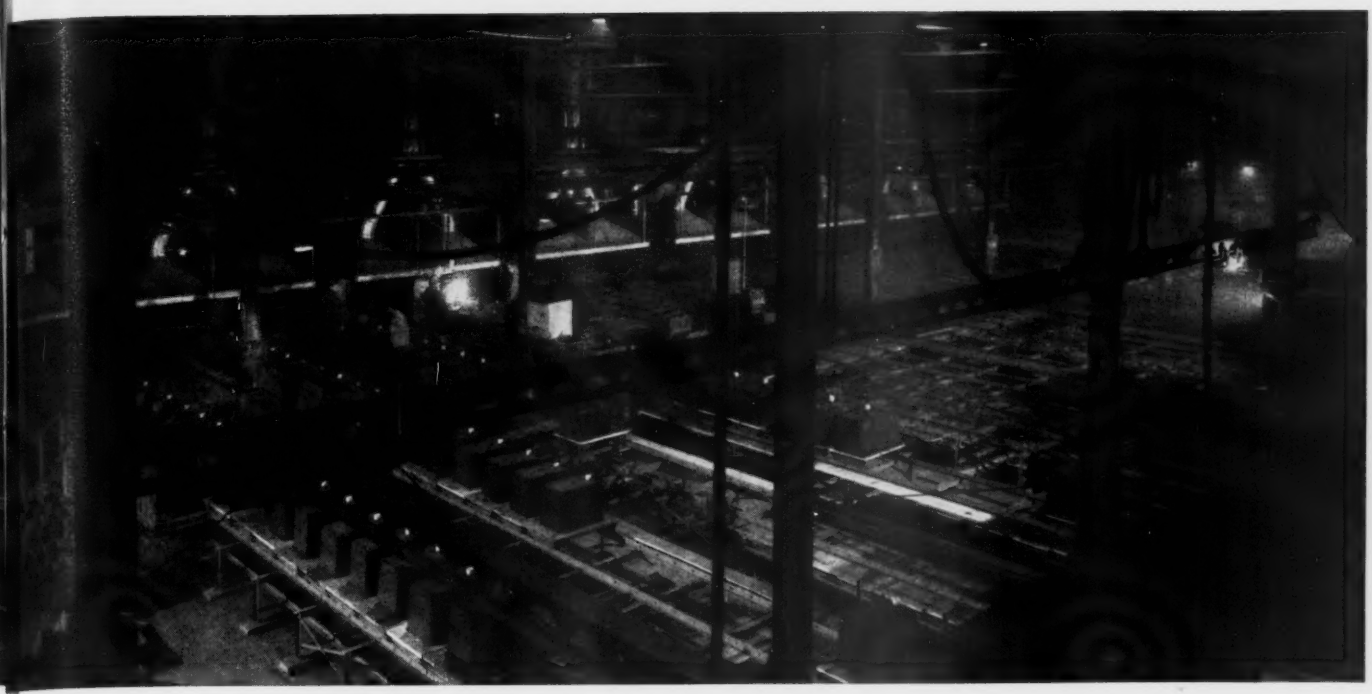
View from west end of floor showing the 19 overhead molders' hoppers. First four are serving two cope and drag floors, with the next fifteen serving individual squeezer molders. Flask sizes range from 12 x 12" to 36 x 36".

modernizes

One of the two 90-ton Newaygo Shakeout Sand Storage Tanks fabricated from Stainclad Steel. Bins have "square to round" hopper bottoms with 8' diameter Newaygo Plate Feeders underneath for the uniform withdrawal of sand.

Large poured mold (36 x 36", made at one of the cope and drag stations) being dumped by a gravity type mechanism into the oscillating conveyor below. After dumping, Mold Platen Car and bottom board are automatically returned to molder on an underneath run of track.





Looking from the Sand Distribution Belt walk-way across foundry towards the pouring floor. Floor is built up to Platen Car track level at pouring and shakeout end of track system. Note the lack of smoke in the mold dumping area. This is controlled by dusthoods over each mold dumper and the oscillating conveyor.

NEWAYGO SANDHANDLING SYSTEM

and mechanizes

West Michigan Steel Foundry Co.

Don F. Seyferth, Executive Vice President of the West Michigan Steel Foundry Co. in Muskegon, Michigan states, "In foundry business today we recognize the fact that competition demands modern equipment. This means more production through mechanization, resulting in time and labor savings plus other cost cutting efficiencies that expert sand handling engineering can effect.

"Newaygo Engineers did just that for us and we are more than just satisfied with the smooth, continuous, every day performance of the system. We are getting the greatest results for the least amount of dollars invested."

The Newaygo Sand Handling System moves up to 90 tons of sand per hour with shakeout sand and castings being carried by an oscillating type conveyor to a vibrating shakeout where castings are separated for distribution to the cleaning room. Shakeout sand is then processed through a vibrating screen and a Newaygo Mill prior to passing into the Sand Storage Bins.

Shakeout sand storage consists of two 90-ton Stainclad Steel bins. Sand is uniformly fed from bins by Rotary Plate Feeders to an elevator which feeds a 20-ton Float Hopper over two Sand Mullors. Mullors are equipped with automatic controls and cooling equipment. Sand is taken from Mullors by a system of inclined belt conveyors to the overhead molding hoppers.

This is the third Newaygo Sandhandling System installed for West Michigan Steel Foundry over a 25 year period.

(See photographs for illustrations of mold handling, pouring and dumping.)

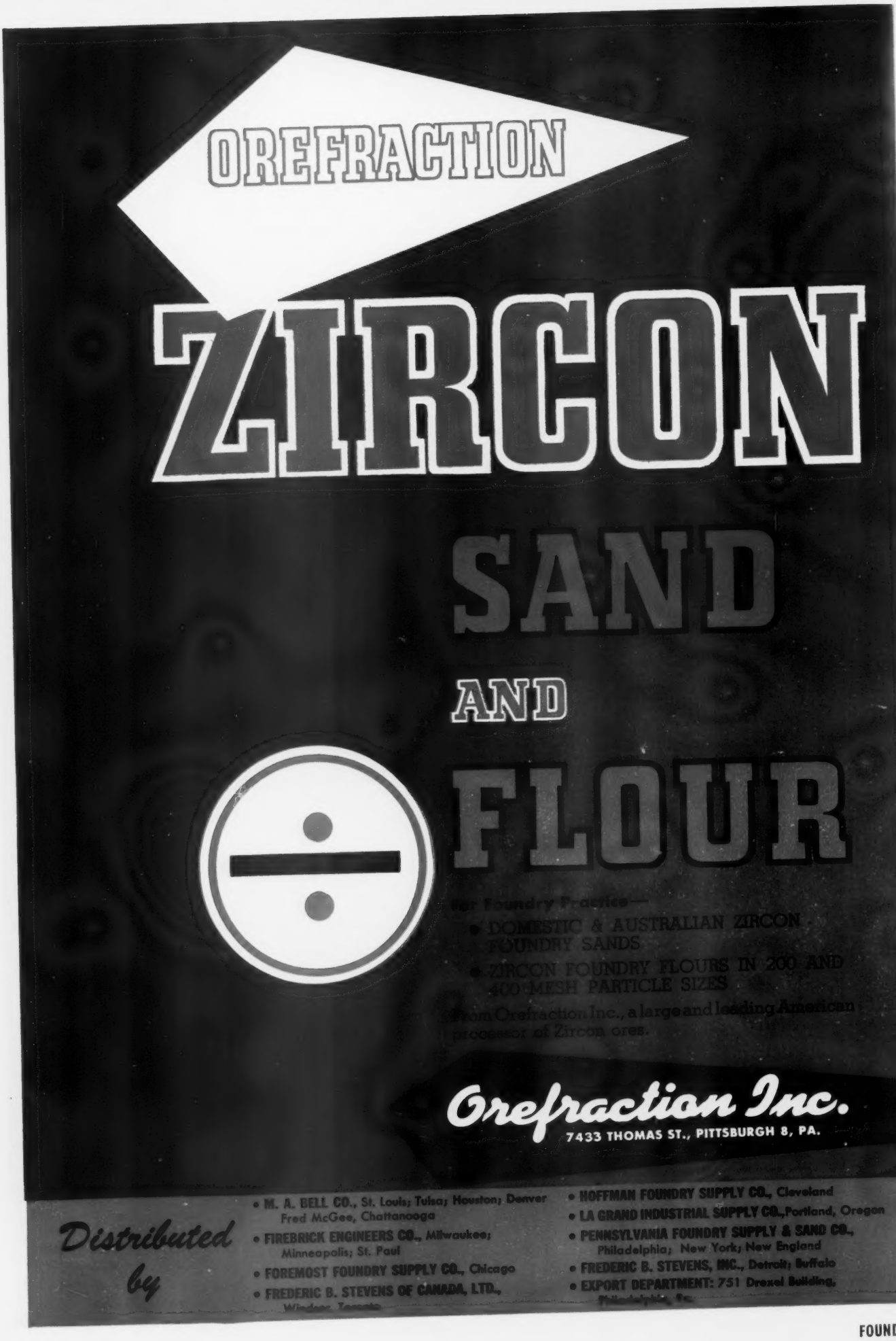
SEE

Our exhibit at the A.F.S. Show — featuring Platen Car and Mold Dumping arrangement; Also new, improved Standard and Super Handy Sandy units.

Cleveland May 8-14
Booths 1528 - 1530 - 1631 - 1623
Aisles - 1500 and 1600
Lower Lakeside Hall

A copy of "Planned Mechanization for Foundries" is yours for the asking. Write, wire, or phone today.

NEWAYGO engineering company
NEWAYGO, MICHIGAN
Manufacturers of Neway® Mold Handling, Sand Handling and Conditioning Equipment


OREFRACTION
ZIRCON
SAND
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FLOUR
for Foundry Practice—
• DOMESTIC & AUSTRALIAN ZIRCON FOUNDRY SANDS
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from Orefraction Inc., a large and leading American processor of Zircon ores.
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7433 THOMAS ST., PITTSBURGH 8, PA.
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● For further information on helpful literature, trade publications, and new equipment descriptions, please refer to IDEAS FOR FOUNDRYMEN insert and return cards on page 395.

FOUNDRY Readers Service

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FOUNDRY
Penton Building
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2	48-49	91	228T	277	320	360	411	442L	464BR	475T
4-5	50-51	92	228B	278	321	361	412	442R	465T	475R1
6-7	52	93	229	279	322L	363	413	443	465BR	475L1
8	53	94	231	280-1	322R	364	414	444T	465BL	475L2
9	54	95	232-3	282	323	365	415	444B	466T	475B
10	55	96-97	234	283	324	366	416	445	466BL	476L
11	56-57	98	235	284	326-7	367	417	446	466BR	476R1
12	58	99	237	285	328	369	418	447	467R	476R2
13	59	100	239	286	331	370	419	448L	467TL	476R3
14	60	101	241	287	332	372-3	420	448R	467BL	477R
15	61	102	242T	288	334-5	375	421	449	468L	477TL
16	62-63	103	242B	290-1	336	377	423	450T	469TR	477BL
17	64-65	104	243	292	337	379	424	450B	469BR	478L
18-19	66	105	244-5	293	338	381	425	451	469T	478TR
20	67	106	246L	294	340-1	383	426	452L	469BR	478BR
21	68-69	107	246R	295	342	385	427	452R	469BL	479T
22	70-71	108	247	296	343	386	428	453	470T	479R1
23	72	109	248	297	344	387	429	454	470L1	479L1
24-25	73	110	251	298	345	388-9	430	455	470R1	479L2
26	74	201	252	299	346L	390	431	456T	470-2	479B
27	75	203	254	300	346R	391	432T	456B	470B	480L
28	76	205	255	302-3	347	394	432B	457	471R	480TR
29	77	207	256	305	348L	399	433	458L	471TL	481R
30-31	78-79	208-9	258-9	307	348R	400	434	458R	471BL	481L1
32-33	80	210-1	260-1	308	349	401	435	459	472L	481L2
34-35	81	212-3	263	309	350	403	436L	460T	472TR	481L3
36	82	214	264	310	352-3	404	436R	460B	472BR	482T
39	83	217	265	311	354	405	437	461	473R	493
40-41	84	218	266	312	355	406	438	462T	473TL	494
42	85	220-1	267	313	356	407	439	462B	473BL	IBC
43	86	223	269	314-5	357	408	440T	463	474L	OBC
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8	53	94	231	280-1	322R	364	414	444T	465BL	475L2
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40-41	84	218	266	312	355	406	438	462T	473TL	494
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FOUNDRY Readers Service

We make our own steel

The quality control no other bearing manufacturer can give you

TO find steel good enough for Timken® bearings, we had to go into the steel business ourselves.

Because we're the only bearing company that makes its own steel, we're the only one that can control bearing quality every step of the way —from melt shop through final bearing inspection. It's by far our costliest and most important quality control.

Equipped with nine huge electric furnaces, three of them brand new, our mill is as advanced as science can make it. Our steel research staff is constantly searching for ways to make Timken bearing steel better. For instance, we were the first company to analyze steel with a direct-reading spectrometer for split-second control of the melt.

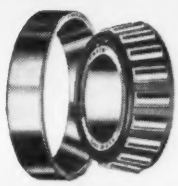
Making our own steel is only one of the scores of production, control and inspection steps we employ to make Timken bearings the finest. To be absolutely sure of the highest performance standards in the equipment you build or buy, always specify Timken tapered roller bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN BEARING EQUIPPED

This symbol on a product means its bearings are the best.

TIMKEN

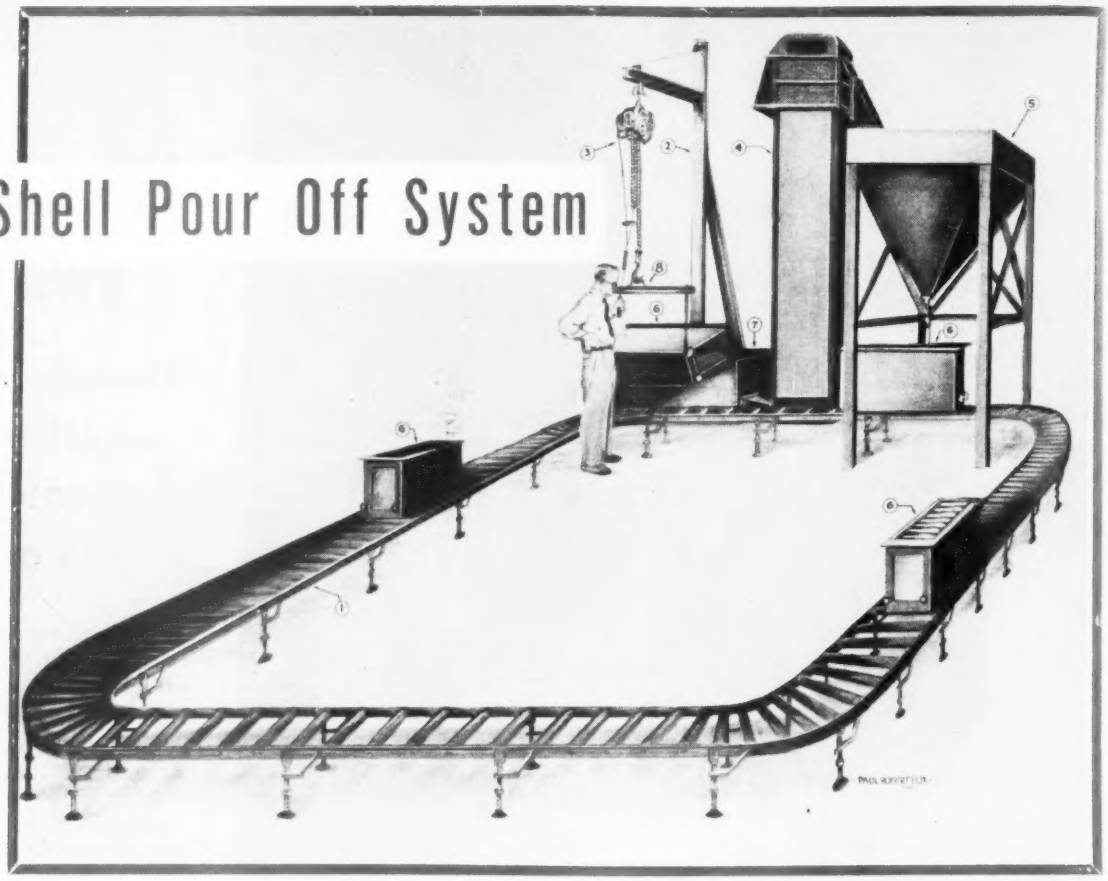
TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ○ THE TIMKEN TAPERED ROLLER

BEARING TAKES RADIAL ○ AND THRUST ○ LOADS OR ANY COMBINATION

Arrow Shell Pour Off System



1—Complete endless roller conveyor system of rugged construction for continuous pouring off.

2—Jib crane of I-beam and rail construction. This independent unit can be placed in any position.

3—Hoist is optional for air hoist or chain electric hoist of 500 pound lifting capacity.

4—A belt type bucket elevator completely enclosed and enclosed motor drive of sufficient capacity to keep a continuous pouring off system supplied with backing up material.

5—Sand storage adequate to keep sufficient sand for constant box filling.

6—Shot boxes can be supplied depending on the pouring off method used and the size of the casting being poured. Designs available for any type desired.

7—Shake out arrangement consists of screens separating castings from back up material and fines from back up material.

8—Box lifting sling can be supplied for any type of pour off box.

Minimum floor space required is 21'6" by 25'6" and can be lengthened out to any length necessary.

The inside area of this system will house the shell molding machine, blender, storage racks and bonding equipment, therefore eleminating unnecessary handling and space.

This system can be set up to conform with your present melting or pouring off arrangements, as it is entirely portable with the exception of the material elevator, which is set below the floor level approximately 12".

Shot, sand or gravel can be used as back up material with satisfactory results. Casting shake out separate the castings from the back up material, and screens other fines.

Steel back up boxes are not included in the above equipment as various types of methods can be used. and in some instances no back up material is required for pouring off.

The entire pouring off system will be shipped complete and ready for assembly. This unit can be assembled by your staff, as erection blue prints will be furnished with the equipment. Installation supervision is available from our plant at a flat rate of $150.00 per unit.

The cost of the unit as described is $3,500.00.

foundry engineering service for shell molding

DIRECT TO LOWER CASTING COST

ARROW

producers of shell molding patterns

pattern & engineering co.

2340 McKINLEY AVENUE ERIE, PENNSYLVANIA

(*Concluded from page* 325)
position corresponding to the preset power input. This speed regulating feature reduces electrode hunting and power surges, and provides a smooth stepless range of control that cannot be achieved with conventional methods.

The speed and direction of rotation of the electrode motor are controlled by the magnetic amplifier control unit depicted in Fig. 3. The input signal to the magnetic amplifier control is obtained from a metering current transformer, which produces an alternating current signal proportional to arc current. This signal is rectified and then compared with a reference voltage. The circuit is designed so that the magnitude of the magnetic amplifier output will vary in proportion to the difference between the signal and the reference. The magnetic amplifier output is used to drive the electrode motor. The motor is a split-field, series-wound direct-current machine.

The direction of rotation is determined by the field which receives the higher voltage from the magnetic amplifier. When the magnetic amplifier supplies a higher voltage to the "in" field than to the "out" field, the motor drives the electrode in. When the reverse is true, the "out" field controls the direction of rotation and the electrode gap is increased. Because the magnetic amplifier is sensitive to minute variations in input signal, it will cause the electrode motor to compensate quickly for any fluctuations in arc current, thereby maintaining the input power to the furnace within very close limits.

The magnetic amplifier is particularly well suited for use in foundry applications. Built like a transformer, it has no moving parts, no electronic tubes, and requires no warm-up period. It is rugged, accurate, reliable, and requires little maintenance. It responds quickly to changes in input signal. The control panel shown in Fig. 3 incorporates loss of voltage protection and other controls for rocking the furnace in addition to the magnetic amplifier electrode control.

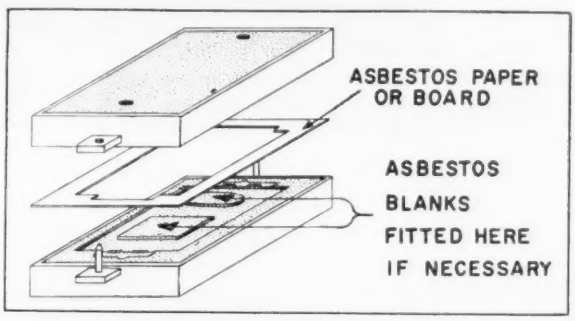
While the reduction in melt time and power consumption are probably the most dramatic advantages expected from this new control, it appears at this writing that other savings, no less important to the foundryman, can also be realized. Because this control reduces the intensity and duration of the power surges which always occur when cold metal is charged into the furnace, it is reasonable to expect that electrode consumption will be reduced. It also appears that refractory life will be increased because the closely regulated input to the furnace will allow the charge to absorb the heat at the most advantageous rate for efficient melting operation of the unit.

Investment Casting Group To Survey Industry

A comprehensive survey of all companies engaged in the manufacture of investment castings is now in process. The survey, sponsored by the Investment Casting Institute, is designed to study the present capacity of the industry and to obtain an insight into its problems and its potential for future expansion.

Questionaires recently were mailed to all known companies engaged in investment casting manufacture. Companies which did not receive the questionnaire may obtain a copy by writing the Investment Casting Institute, 27 East Monroe St., Chicago.

HOW TO DO IT



Thickening Thin Castings Without Changing Patterns

By F. J. McCULLOCH
Yorkshire, England

SOMETIMES it is necessary to thicken a pattern to strengthen the casting, add extra machining allowance or avoid the occurrence of misrun castings. In cases where the alteration is of extreme urgency or only a limited number of castings are required, the desired casting thickness can be achieved quickly and conveniently without the necessity of making time-consuming alterations to the pattern.

The suggested procedure is illustrated in the accompanying sketch and consists of making up the difference in thickness required by inserting a frame of soft asbestos sheeting of appropriate shape and thickness between the cope and drag. Internal shape of the frame should be cut slightly larger than the mold cavity outline. Any flash subsequently formed at the joint can be trimmed off.

The frame may be nailed or glued to the drag before the mold is closed or left loose, depending upon the thickness of the asbestos sheet used. Loose strips of asbestos can be used when the pattern has a fairly even outline, but under such circumstances it is advisable to nail or glue the strips in position before closing the mold.

If the casting is being thickened appreciably and there are openings in the pattern, suitably shaped asbestos blanks should be placed within the mold to prevent formation of heavy flash in the open areas.

This method of thickening a casting is particularly suitable when the mold parting joint is on one level, but it also can be used in cases where changes in parting joint levels are not too abrupt.

Editors' note: This item was abstracted from *Foundry Practice*, house organ published by Foundry Services Ltd., Birmingham, England.

Do you have any tricks of the trade tucked away with your foundry experience? Why not release them to fellow foundrymen? FOUNDRY will pay a minimum of $15 for each idea submitted and published. Send a photo or drawing with your idea

Turn an Engineering Eye on Profits

Is your foundry set up to make all the operating profit you ought to get? Or are your profits leaking away because antiquated equipment performs inefficiently, or plant layout that just grew demands too much expensive labor?

You *can* cut costs and raise profits by getting a sharp engineering eye turned on your problem—the experienced eye of a PEKAY engineer, for example. PEKAY engineers have handled such major developments as the unique slurry system of the huge Ford foundry at Cleveland (the illustration below shows the PEKAY-designed control center)—and likewise many smaller assignments to improve production conditions in foundries large and small.

Our engineering eyes, and ideas, are at your disposal. Without obligation, we'll be glad to look over your picture with you. And it will be worth your while to learn more about why PEKAY-designed equipment is doing a ***better*** job in more and more foundries. Write us today!

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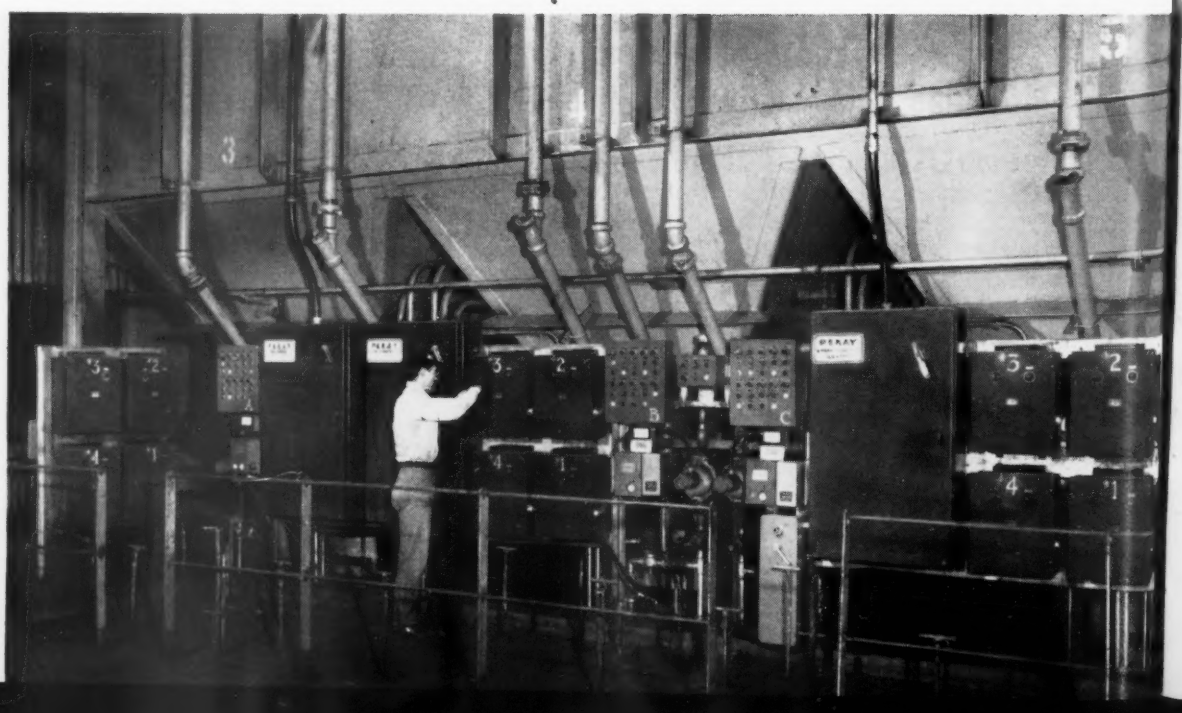
SLURRY SYSTEM, FORD FOUNDRY, CLEVELAND



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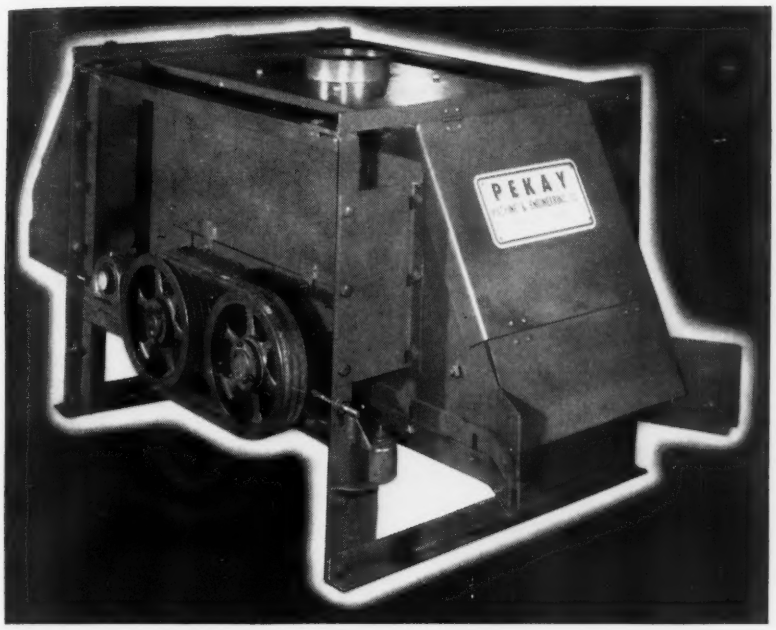
This smartly engineered unit increases *Permeability;* boosts *Green Compression Strength;* maintains correct *Moisture Content.* Units now in use produce up to 85% more volume per hour, with half the bonding material! What's more, the purchase price is less—installation costs are lower—maintenance is easy and infrequent.



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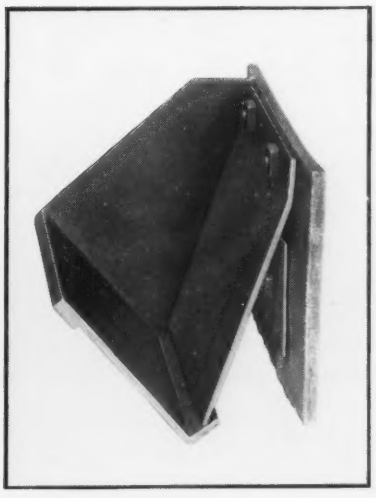
For a comparatively small investment, the AIRATOR gives you a constant outflow of better sand, with *total availability* of your production lines at all times. It can't clog or choke up; and even during occasional maintenance, lines needn't shut down. You'll cut scrap loss—reduce machining time—stop lump trouble.



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ELEVATOR CONVEYOR BUCKETS

Thousands of M-T-Matics have replaced old fashioned buckets in foundries everywhere—because they *empty every trip.* Irresistible leverage of separately mounted back plate as it goes over top pulley sweeps contents *entirely* clean—loads *can't* stick! And double mounting makes belts last much longer. Available in standard sizes.

Drop in and chat with us, and see a complete display of PEKAY equipment at the Foundry Show,

BOOTH 1029

Story of Wheel Is Told By Swiss Foundry

As part of a series of publications issued in connection with the company's 150th anniversary of its founding, George Fischer Ltd., Schaffhausen, Switzerland, has published a book, "Aus der Entwicklung der Rader fur Lastwagen und Omnibusse" (The Development of Wheels for Trucks and Omnibusses).

This extensive volume, 175 pages, is written in German and recounts the story of the development of the wheel, how it came into existence and the significance that underlies the countless forms of wheels now in use. The book is devoted principally to the story of cast wheels for commercial vehicles of all kinds and portrays the early pioneering efforts of automobile designers who had faith in steel foundry engineers. Development is carried from the early solid iron wheels via the solid rubber to the balloon tired and on to today's lightweight, detachable rim, pneumatic-tired wheel.

The extensive influence of motor vehicle wheels on other fields is also pointed out as the book reveals the infinite variety of new forms the wheel has passed through from the beginnings of civilization to the present day. The book focuses attention of the abundance of intellectual and practical work that has gone into the making of the wheel —an article which today is taken so much for granted.

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Michigan Conference To Be Held Oct. 14-15

Annual AFS Michigan Regional Conference—carrying the theme of the expansion of the casting market, improvement of casting quality and better castings at lower cost through applied engineering—will be held at the University of Michigan, Ann Arbor, Mich., on Oct. 14-15, 1954.

General conference chairman is Kenneth H. Priestley, Vassar Electroloy Co., Vassar, Mich. Other committee chairmen are: Program, Woodrow W. Holden, Eaton Mfg. Co., Vassar, Mich.; Entertainment, Lachlan Currie, 343 North Marshall Ave., Marshall, Mich.; Finance, Claude B. Schneible, Claude B. Schneible Co., Detroit 2; Publicity, John Van Haver Sealed Power Corp., Muskegon, Mich.

The complete program with the speakers for the technical sessions will be announced soon.

Book Review

Induction and Dielectric Heating by J. Wesley Cable, cloth, 576 pages, 6 x 9 in., published by Reinhold Publishing Corp., New York. Price $12.50.

According to the publishers, this is the first book to cover both major methods of high-frequency heating. Mr. Cable offers an organized treatment of uses and applications of high-frequency heating in industry through division of his material into two major sections — induction and dielectric heating, respectively.

Each section begins with the fundamental theory of the method and the operating principles of equipment used as sources of electrical energy. Coil and electrode design, construction of mechanical jigs and fixtures, and work handling methods also are covered.

Forging, melting, brazing, hardening and other metalworking operations in which heat plays a part, as well as the fields of plastics, woodworking and food processing in which dielectric heating finds application, are discussed in subsequent chapters.

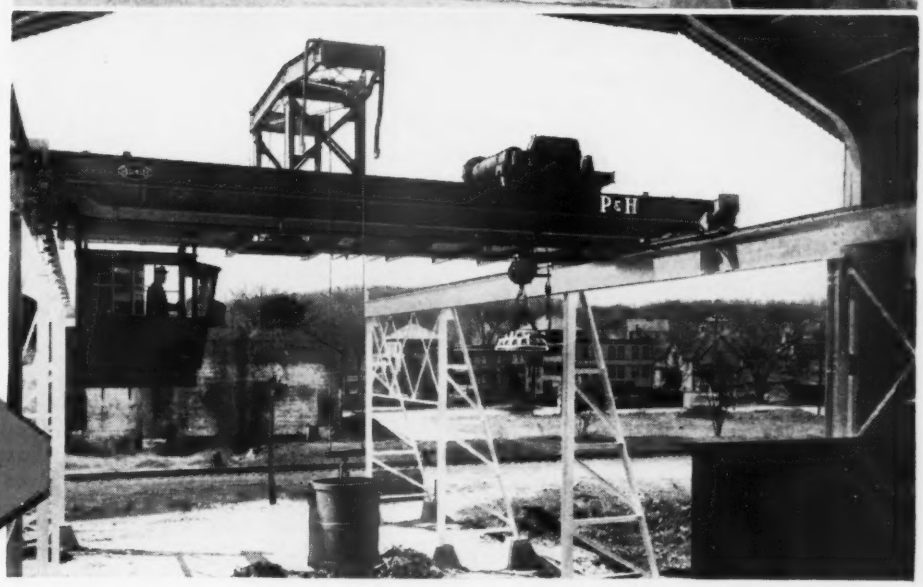
P&H OVERHEAD CRANES

How this Magnet Crane

A. M.

"Doubles" as a Cupola Charger

P. M.



Ordinarily, we don't go looking for ways to do ourselves out of any business. Like telling people how to make *one* crane do the work of *two.*

But here's an idea you should know. It could (and very well might!) save you some real money — if your plant setup is such that you could take advantage of it.

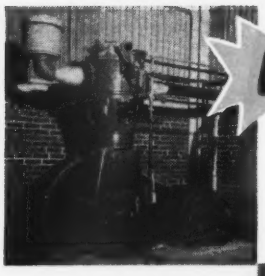
This smartly engineered crane is a dual-purpose unit. In the morning, it works as a foundry makeup crane, filling buckets for the cupola. In the afternoon, it is used as a cupola charger to move the buckets. Never a dull moment.

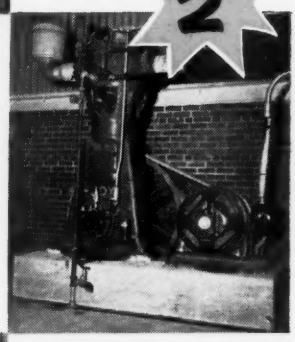
We built this combination crane for a well-known west coast manufacturer. It is doing a wonderful job. Perhaps such a crane would save time and money on your operations. If so, we'd be glad to build one for you. At least we'll be glad to give you all the facts. There's no obligation. Write us.

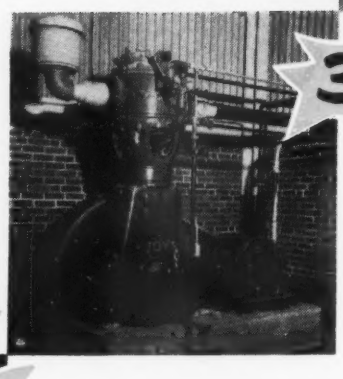
P&H OVERHEAD CRANE DIVISION
HARNISCHFEGER CORPORATION
MILWAUKEE 46, WISCONSIN

the P&H Line

...They've added their FOURTH JOY WG-9 COMPRESSOR







Certain-teed's new Oklahoma paper mill uses compressed air in the manufacture of gypsum board papers. In addition, compressed air is used in general shop service, and it also furnishes the pressure for the ever-so-important automatic sprinkler system.

With such dependence upon air supply—24 hours a day—Certain-teed's engineers "bet on the Champ" and, for the fourth time in a row, specified a Joy WG-9 vertical compressor.

The WG-9 is a water-cooled, double-acting, single-stage compressor built to deliver medium amounts of air *constantly*. It, alone in its class, offers replaceable crosshead guides and cylinder liners, force-feed lubrication, and bearings that *never* need adjusting. As an extra bonus, "Dual-Cushion" valves are included to give higher valve capacity and better heat dissipation.

All-in-all, the WG-9 is a potent performer—able to take the measure of any compressor in its class. Get the specifications and check the record . . . you'll be convinced, too. Bulletin A-43 gives all data and will be sent upon request. ● ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

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Executives of McCulloch Motors Corp. inspect a scale model of their die casting department

Employs Close Control in DIE CASTING MAGNESIUM

By THOMAS A. DICKINSON

BY DEVELOPING unusually effective methods of die casting magnesium alloys, McCulloch Motors Corp., Los Angeles, has been able to reduce casting rejects due to temperature variations to less than 0.5 per cent.

These methods also have minimized the danger of fire, improved working conditions, and accelerated production. In fact, its die casting practice is said to be one of the main reasons why McCulloch today is known as the world's largest manufacturer of gasoline-powered chain saws, as well as a leader among the country's producers of magnesium die castings.

Magnesium alloys are highly useful in the manufacture of products like chain saws, because their extreme light weight permits the production of final assemblies which are portable despite relatively large dimensions and complex construction.

A typical McCulloch saw, weighing 49 lb, comprises 23 magnesium die castings with a weight of 18 lb. Dowmetal R is the most commonly used magnesium alloy for die casting purposes.

The initial step in preparing the alloy for die casting operations at McCulloch consists of warming and drying 25-lb ingots in a gas flame. This removes entrapped vapors.

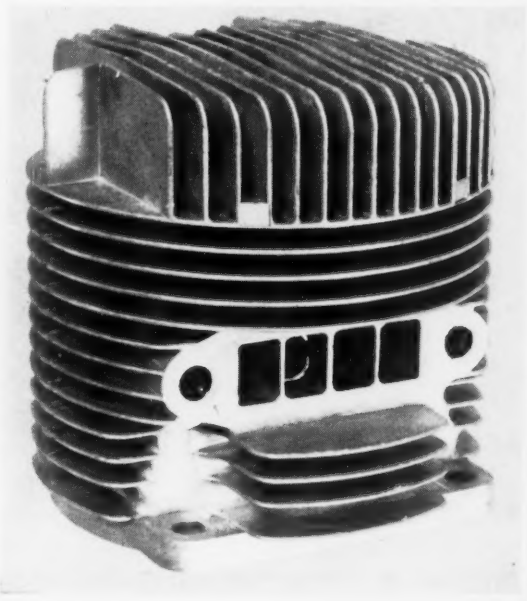
Next, the ingots are placed in an 80-kw, 1000-lb electric-resistance breakdown furnace which is controlled by a panel with two in-series pyrometers. One of the latter is an override thermocouple which is used to set the maximum limit of temperature for the magnesium (about 1300° F) while the other is an anticipating type of thermocouple which brings the magnesium up to the desired working temperature (about 1225° F). About two hours are required to bring the first pot up to temperature, after which the process is continuous.

Besides minimizing the need for maintenance, the electric furnaces make it possible to bleed bottled sulphur dioxide flux over the surfaces of the hot metal. Further, the electric furnace temperatures can be controlled within plus-minus 2°.

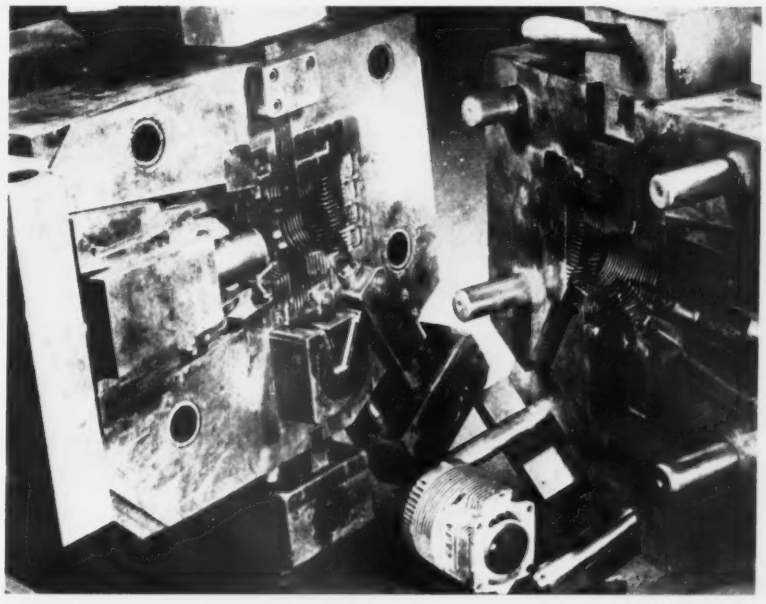
Molten magnesium with a specified die casting temperature is poured as

(*Continued on page* 342)

Cylinder head for air-cooled engine is one of the more complex parts die cast with magnesium alloys



Close-up view of mated die assemblies being used in die casting magnesium cylinder heads



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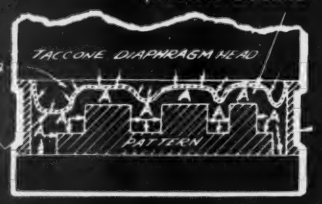
Pressure surface of diaphragm on sand is approx. 40% greater than the area of the flask

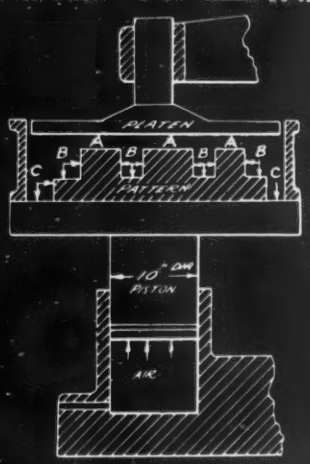
Flask size = 12" x 18"
Area = 216 sq. in.
216 + 40% = 302 sq. in.
302 sq. in. x 80# line pressure = 24,160#

24,160 pounds total pressure on sand



A—DENSITY OF RAM ESSENTIALLY IDENTICAL AT ALL POINTS

80 LB. LINE PRESSURE



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B—MEDIUM RAM
C—SOFT RAM

6,280 pounds total pressure on sand

Area of 10" dia squeeze piston = 78.5 sq. inches. 78.5 x 80# line pressure = 6,280#

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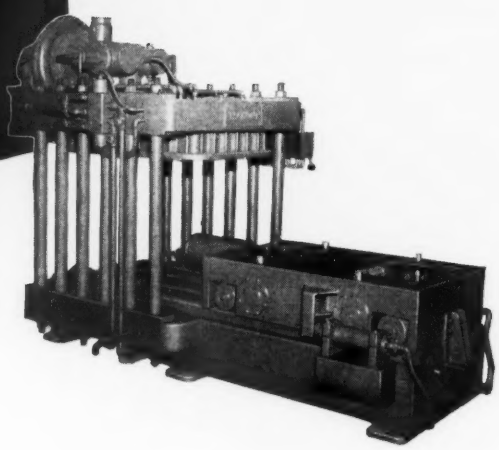

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Cuts Coke and Sand Handling Costs

HANDLES COKE WITH MINIMUM DEGRADATION

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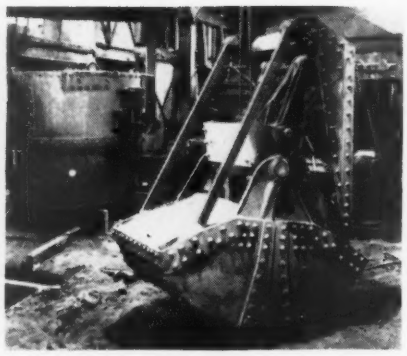
Blaw-Knox "Shark Tooth" Single-Line Hook-On Buckets are the double-barrelled punch you need to cut the cost of re-handling coke, coal, sand and small limestone, *because they are dual-purpose buckets.* With liner plates attached, you can handle fine granular materials with minimum leakage. Without the liner plates, the "shark teeth" assure minimum degradation of coke.

BLAW-KNOX SINGLE-LINE HOOK-ON TYPE BUCKETS SOLVE AVERAGE OR UNUSUAL HEADROOM CONDITIONS

For extremely limited headroom, this ¾-yd. bucket requires only 6'7" operating headroom. Blaw-Knox Buckets designed specifically for low headroom conditions are also available in larger sizes.



For average headroom, there's a size and type of Blaw-Knox Foundry Bucket to meet a wide range of conditions. Write for Bulletin 2232 for details.

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BLAW-KNOX
FOUNDRY BUCKETS
THE MOST COMPLETE RANGE OF SIZES AND WEIGHTS

(*Continued from page* 339)

it is needed into a 400-lb capacity transfer furnace which has a 1300° pot temperature. A fork lift truck is used to convey transfer furnaces to and from the electric furnaces and the plant's 21 die casting machines.

Heat losses in metal transferred from the electric furnaces are usually such that the desired casting temperature (1225° F) is attained. Die castings are next produced at rates as high as four per minute per machine.

Although most die castings are mass-production items, McCulloch can economically die-cast less than 500 duplicate parts because the company has evolved a method of fabricating dies which can be used for either large or limited production runs without increasing manufacturing costs as much as might be expected.

Assembled Die Components

Such tooling is provided by assembling a number of different die components, instead of by machining solid blocks of steel in the usual manner. Assembled tooling is advantageous because:

(a) Certain standardized parts can be recovered for further use after a given die has served its production purpose.

(b) Burned or damaged dies do not have to be scrapped, since parts with damaged areas can be removed and replaced.

The basic component of each die assembly is a steel block, center section of which has been machined so that a variety of cavity components can be bolt-assembled therein. This block represents more than 50 per cent of the steel that must be salvaged when a conventional die is taken away from the production line. Yet, because of its standardized details, it can be reused indefinitely.

Many cavity components must naturally be made to order. However, this is not an inherently expensive process because most cavity designs can be broken down to the point where tooling parts can be machined or otherwise fabricated without special patterns. Further, some cavity components—such as ejector pins and clamps—have been standardized so that they too can be reused as long as they are undamaged.

Both single and multiple cavity dies are being fabricated by McCulloch for die-casting purposes. The multi-cavity dies are generally used

(*Concluded on page* 344)

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- JOLT SQUEEZE PIN LIFT

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If you want sturdy construction with less servicing . . . be sure to look at Davenport Molding Machines. They have outstanding records of low maintenance costs.

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Ph. Bonvillain & E. Ronceray, Choisy-Le-Roi, Rue Paul Carle, Seine, France

(*Concluded from page* 342)

for the simultaneous production of two or more identical articles, not two or more different articles, because few (if any) dissimilar parts are needed in identical quantities.

Tolerances for critical dimensions in McCulloch die assemblies range from 0.010 to 0.001-in., plus or minus.

Flash resulting from use of assembled dies is said to be no greater than the flash produced in using conventional dies, because of the close-tolerance dimensions of the assemblies and the tendency of molten magnesium alloys to solidify rapidly after they come in contact with cool steel surfaces.

How To Promote Use of Respirators

Getting employees to use respirators when and where they need to is a common problem in many industries. Typical of excellent policy and practice on this score is Richmond Radiator Co., at its Monaca,

Pa., plant, where (1) men are required to wear respirators in certain operations; (2) encouraged and permitted to wear them elsewhere, at individual option; and (3) respirators are maintained effectively on a co-operative basis.

Health hazards have been reduced or eliminated because employee attitude towards the use of respirators has been excellent, keynoting the plant safety program which in all its phases is considered by everyone as "everybody's job."

Major product of the Monaca plant is porcelain enameled cast iron plumbing fixtures, from casting through finished units. Because of the widespread notion that "if you work in foundry you need respira-

(*Continued on page* 346)

Patterns

LARGE or small

Whether your pattern is to be as large as this 10 ft. diameter dredge cutter—or as small as a thimble, you are assured of prompt service and precision performance when you depend upon DANKO. 34 years' experience have given us know-how second to none in the production of metal or wood match plates, cope and drag machine plates and permanent molds.

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OPERATORS' CONSENSUS:

"Easiest lining to install—by far!"

Developed by CARBORUNDUM for nonferrous crucible furnaces, these rings, plus a castable cement, make the slickest lining ever. From start to finish, *a complete lining takes just 1½ hours to install*—and that's without benefit of hoist or other equipment! The rings are set by hand, and the back-up cement is simply mixed with water and poured. What could be easier?

The rings are silicon carbide, and the cement is our special, insulating castable made of alumina "bubbles" and bond. The rings are only 1½" thick, so there's ample space for insulation. This combination makes a lining that usually *lasts 1½ to 2 years, and frequently even longer.*

The silicon carbide stays hard and clean; goes month after month without even needing patching. The alumina cement makes one of the best insulating materials available for high temperature work. It often makes possible big fuel savings per pound of metal melted; and it's not uncommon to get *one or two extra heats per day.*

SOUND INTERESTING? If you will brief us on your operating conditions, we'll send recommendations. And don't forget, we make *all types of linings*—rings, segments, and cements. Address: Dept. A-54, Refractories Division, The Carborundum Co., Perth Amboy, N. J.

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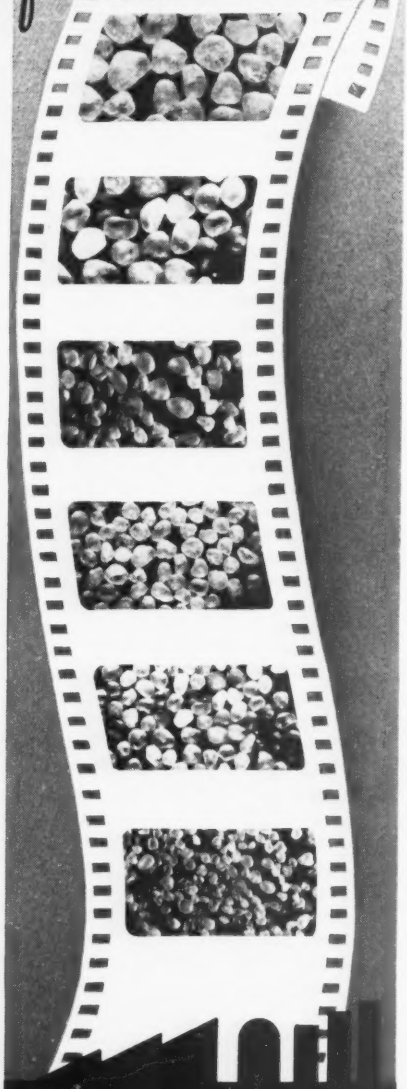
Registered Trade Mark

the right SAND for Every casting need

This is Wedron's specialty! No matter what sand you need, from the finest silica flour and fine grades for shell molding to coarser grades for standard casting methods, Wedron can supply you with uniform size, fine, rounded grain sand. For best results in every casting situation, get the right sand for the job...

from WEDRON



MINES AND MILLS IN THE OTTAWA-WEDRON DISTRICT

WEDRON SILICA COMPANY

135 SO. DEARBORN ST. CHICAGO 3, ILL.

(*Continued from page* 344)

tory protection," respirators are provided for those who wish to wear them in foundry operations. Several other jobs, at Richmond Radiator, require the use of respirators: Grinding, slushing, and chemical-weighing.

Safety and medical men point out that there is no operation in any department of the Monaca plant that could be accurately described as involving toxic materials. But they recognize a need for respiratory protection in the last three jobs cited.

Respirators are not required, but worn on individual option, in the shakeout operation of this foundry. For grinding, however, they are needed, and company safety policy requires respirator wear. Men doing swing-grinding of tub and sink edges wear the protective devices, as do others on hand-grinding at a later stage.

J. J. Munro, plant manager, and B. O. Nolan, personnel director, report that respirators are not required for the shotblasting operation which precedes the first (swing) grinding, because this is an entirely automatic phase that involves no human participation. Conveyors carry castings to and from the shotblast booth.

Men doing the slushing—application of a water-base primer coat to the bare iron castings, prior to vitreous enameling—must wear respirators.

In the weighing operation, which involves mixing and handling of chemicals such as feldspar, this respiratory protection also is required.

Despite the thorough indoctrination of employees in the need to wear respirators on certain jobs, it was decided years ago at the Monaca plant that they might not do so, without exception, unless it was made as easy and convenient as possible. This practical philosophy led to (1) a constant search for the most comfortable and efficient respirators available, and (2) a thorough and practical program of respirator care and maintenance.

Comfort depends in large part on light weight; even if a respirator seems light when you first put it on, maybe it would seem increasingly heavier as the working day wore on. Then there would be a tendency—ill-advised but understandable—for a tired man to remove his respirator before he should.

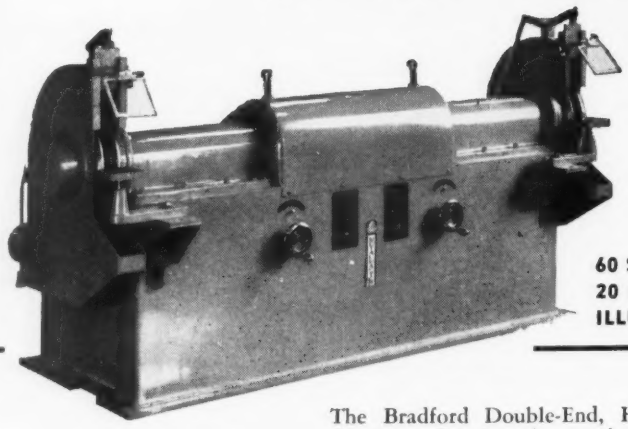
Almost two years ago Mr. Nolan

(*Concluded on page* 348)

Let BRADFORD

SPEED YOUR GRINDING WORK—

Standard or Special



60 SIZES AND MODELS
20 HP. Model ILLUSTRATED

The Bradford Double-End, Heavy-Duty Snagging Grinder shown above is just one of many Bradford designs that help speed foundry production and reduce costs. With individual, infinitely variable speed drive, both wheels can be used simultaneously or individually at same or different speeds. Fixtures can be supplied to adapt this grinder to special purpose work or special models can be designed to meet your requirements. Let Bradford engineers help solve your grinding problems—you'll profit.

THE BRADFORD MACHINE TOOL COMPANY
661 Evans Street, Cincinnati, Ohio
Precision Since 1840

THAR'S GOLD IN THEM THAR SAND HILLS!

There's gold in the waste sand in your foundry, too. It's there, now . . . gold . . . hard cash . . . and you don't need a pickax to get it.

• If you use 12 tons or more of sand a day, you owe it to yourself to look into the cold blooded, pay-for-itself economics of a Hydro-Blast sand reclamation system.

• ***How to do it?*** Easy, Let us process a minimum of 5 tons of your waste sand in our pilot plant, under actual production conditions . . . and then let the results speak for themselves.

• ***A suggestion:*** Use the coupon to learn how easily we can arrange for a test of your waste sand in our pilot plant.

At the same time, ask for a copy of our simple Self-Survey Form S-200. It will give you an approximate but eye-opening idea of the savings that are possible.

Hydro-Blast Corporation
2550 North Western Avenue
Chicago 47, Illinois

Please send following without obligation:

☐ Information on pilot plant test of our used sand

☐ Sand Cost Self-Survey Form S-200

Name and Title _____

Company _____

Address _____

City _____ Zone ____ State ____

HYDRO-BLAST CORPORATION

2550 NORTH WESTERN AVENUE CHICAGO 47, ILLINOIS

BOOTH 505 CLEVELAND FOUNDRY SHOW • MAY 8-14, 1954

SEE OUR AUTOMATIC SAND CONTROLS AT THE FOUNDRY SHOW, BOOTH NO. 502

See the

HARTLEY HYGRO-GUIDE
AUTOMATICALLY CONTROLS MOISTURE

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HARTLEY TIME-GUIDE
AUTOMATICALLY CONTROLS EVERY PHASE OF MIXING CYCLE

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BOND GUIDE
MEASURES AND CHARGES EXACT AMOUNT OF BOND AUTOMATICALLY

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SAND LEVEL CONTROL
ASSURES THE MOLDER A CONSTANT SAND SUPPLY IN THE HOPPER

★

HAYLCO CONTROLS Corporation
NEENAH, WISCONSIN
The original manufacturer of automatic controls for sand systems.

(*Concluded from page* 346)

decided it would be advantageous to standardize on one type of respirator. His choice was the new MSA Dustfoe No. 55, a lightweight (2¾ oz.) and compact respirator allowing maximum visibility and providing efficient filtering of dusts with minimum breathing resistance. Since then it has become the standard for the plant.

Men are encouraged to change the "static web" throw-away filters on the respirators as often as they feel they need to; the average, Mr. Nolan reports, is twice each working day.

Each man keeps his own respirator, exchanging it for a new or rebuilt unit when he believes it to be necessary. The plant management sees to it that respirators are rebuilt, cleaned, sterilized and new paint applied as needed. Actually, rebuilding and major repairs are rarely needed; only frequent changing of the disposable filters.

Balanced inhalation valves are easily and quickly installed or removed; filter edges are exposed to observation for positive pressure seal; positioning pins assure proper seating of filters.

Executives of Richmond Radiator Company point out that the safety practices and policies at Monaca of this prominent producer of plumbing and heating equipment are typical of those throughout its plants—at Uniontown, Pa., also a foundry installation; Metuchen, N. J., and New Castle, Del.

Welding Papers To Be Read at Buffalo

Thirty-nine papers on various aspects of welding will be read at the national spring meeting of the American Welding Society, at Hotel Statler, Buffalo, May 4-7. An elaborate display of welding equipment and accessories will be on exhibition at the Buffalo Memorial Auditorium, where the second Welding Show will be in progress.

Thirteen basic subjects will be covered with three papers included in each group. Major topics to be covered are weldability, inert arc welding, structural welding, welding of stainless steel, surfacing and metalizing, resistance welding, pressure vessels and penstocks, welding processes and equipment, welding of nonferrous metals, welding of piping and tubing, and a session on welding applications.

Advance registration cards and hotel reservations can be obtained by writing the American Welding Society, 33 West 39 St., New York 18.

HEAT TREATING
STEEL CASTINGS?

This door is for an oil-fired carbottom annealing furnace.

ADALITE CAST No. 20
AN INSULATING REFRACTORY CASTABLE, GIVES FOUR TIMES INCREASED LIFE . . .

Used here on an Annealing Furnace Door, ADALITE CAST NO. 20, a 2,000°F. insulating refractory castable, has increased life 4 times over the conventional insulating fire brick construction. Proper anchor design and spacing are important but, ADALITE CAST NO. 20 is easy to install, is quick drying and pours like concrete. Ask us for our recommendations . . . *no obligation*. Also, we'd like to give you the name and address of the BOTFIELD Distributor near you.

BOTFIELD
REFRACTORIES CO.
779 S. Swanson St. Philadelphia 47, Pa.
In Canada, Canadian Botfield Refractories Co., Ltd., 171 Eastern Avenue, Toronto

Republic, the only producer of a complete line of merchant pig irons, offers you a field metallurgical service staffed by a group of highly skilled Pig Iron Metallurgists.

The job of the Republic Pig Iron Metallurgist is to help you solve foundry problems or to furnish answers to questions on molding practice. Frequently he is called in to make a routine foundry survey. His recommendations and suggestions often result in improved plant operation, increased production efficiency and unit output with no increase in overhead costs.

Why not join the hundreds of foundries, large and small, that regularly keep in touch with the Republic Pig Iron Metallurgist? There's no cost or obligation for his service.

Write, wire or phone us when you would like him to call at your plant.

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Export Department: Chrysler Building, New York 17, N. Y.

Republic **PIG IRON**

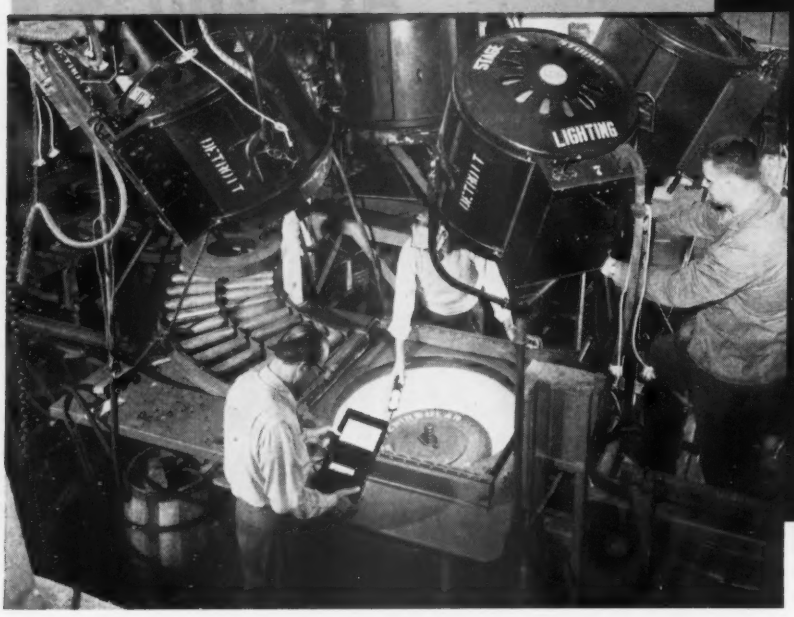
"CHATEAUGAY" Low-Phosphorus, Copper-Free

"REPUBLIC" (Northern) Foundry, Basic and Malleable

"PIONEER" (Southern) Foundry and Basic

REPUBLIC STEEL

Prevent accidents!...See "PLAY IT SAFE"



ACTION-PACKED FULL-COLOR SOUND FILM!

These 8 lamps, totaling 80,000 watts, are focused on a grinding wheel. The wheel, speeded until it bursts, is filmed for "Play It Safe" in slow motion, at 6000 frames per second.

First showing at
Foundry Congress Show May 8-14

See it at
Peninsular Exhibit, Booth No. 1023

Produced for the Peninsular Grinding Wheel Sales Corporation, in the interests of the steel and foundry industries, by the Jam Handy Organization.

Now, for the first time, see, in slow motion, an abused grinding wheel, rotating at high speed, burst into a thousand fragments.

Prevents accidents.—"Play It Safe" is an object lesson in the kind of handling, storing and mounting, and proper speeds, which prevent accidents.

65 years of safety know-how.—All Peninsular's grinding-wheel experience since 1889—has gone into "Play It Safe." This 20-minute motion picture drives home safety lessons viewers can't forget.

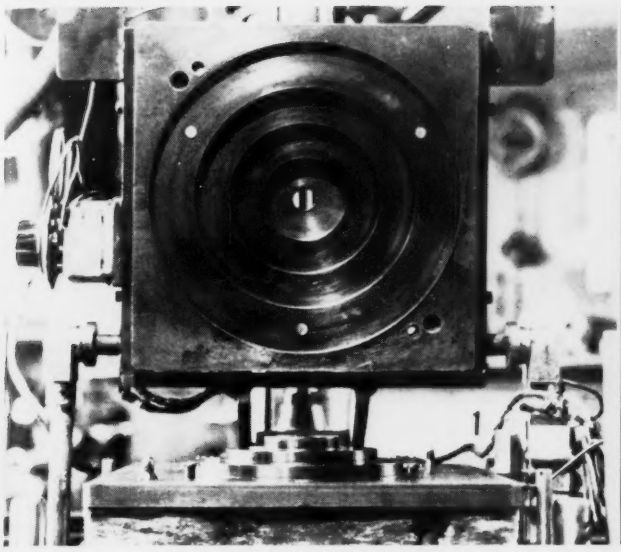
"PLAY IT SAFE"

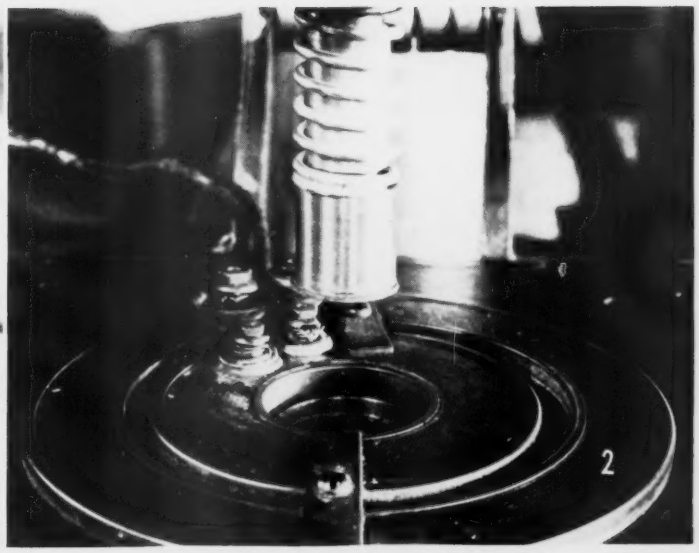
will, we are sure, greatly benefit your personnel. **Be sure to see "Play It Safe"** at the Foundry Congress Show—and put in your request for showings of "Play It Safe" at your plant.

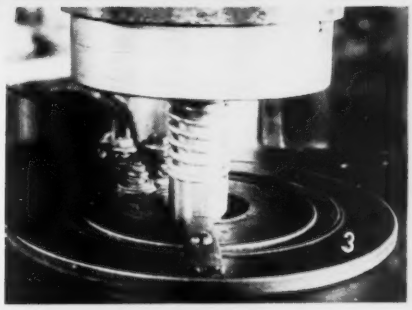
PENINSULAR
GRINDING WHEEL SALES CORPORATION
Plant and General Offices: 729 Meldrum, Detroit 7, Michigan

INDIVIDUALLY PENINSULAR ENGINEERED
SINCE 1889

SPECIALISTS IN RESINOID AND VITRIFIED BONDED WHEELS



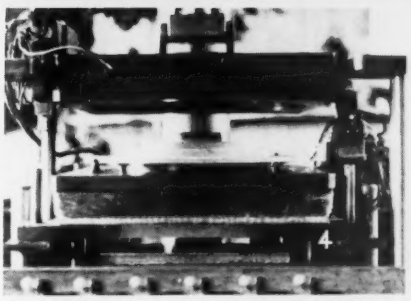


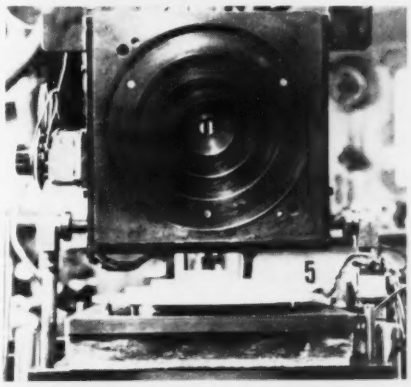


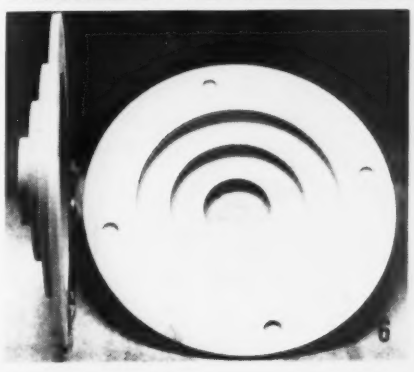
BLOWING MACHINE

Makes Shell Molds and Cores

By L. E. HEXAMER, U. S. Plug & Fitting Co.
Canton, O.
and G. A. CONGER, Cambria Foundry & Engineering Div.
Stevens Mfg. Co., Ebensburg, Pa.







THE most widely used method for producing shell molds employs the principle of investment by dumping a dry sand-resin mixture onto a heated, open-faced pattern. The investment is accomplished by inversion of the pattern, locked to a box partially filled with sand-resin mixture.

Inversion allows the sand-resin to flow by gravity around the contours of the pattern, and an overburden of mix assists in compacting the shell. In this position, the heat from the pattern is conducted to the sand-resin mix, forming a bonded sand shell build-up perpendicular from the pattern surface. A dwell period at this stage determines the thickness of the shell mold half. A re-inversion permits the unbonded mix to fall away from the pattern plate, leaving a rough, nonuniform exterior shell surface.

This method of applying the mix to the pattern flows the sand onto the pattern surfaces at an angle less than 90 degrees. In so doing, certain vertical pattern surfaces are not exposed to the direct flow of the sand and, consequently, these surfaces may not be perfectly formed.

In view of this difficulty a method was developed to produce shell molds and cores with uniformly dense surfaces. This is accomplished by "blowing" the sand-resin mixture into a heated die cavity. The die cavity is formed by a pattern plate, similar to that employed in the usual shell mold practice, and a back-up plate as seen in Fig. 1. The back-up plate is contoured to the general form and shape of the pattern to allow the formation of a shell approximately 3/16-inch thick. This plate may be either cast or machined depending on the accuracy and smoothness required on the shell mold exteriors.

The blowing of shell molds and cores is similar to the conventional practice of blowing cores and the common dump box procedure of making shell molds. It has these features:

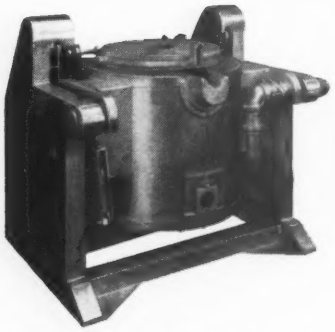
1. A two-part die operating at 400°F to produce a shell 3/16-in. thick requires 10 seconds for curing (baking).

2. The sand mixture has negligible green strength and is in the dry condition.

3. Optimum air pressure for blowing is 30-40 psi. In this range erosion is minimized, yet permits complete filling of the die cavity.

4. To prevent resin segregation, a so-called resin-coated sand is re-

(*Continued on page* 354)



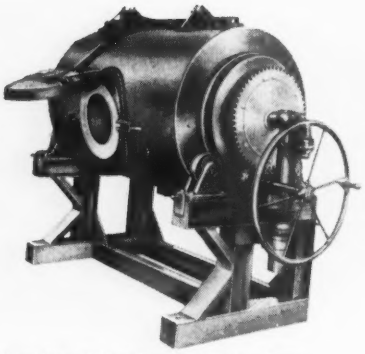
Lindberg-Fisher type MNP nose-pour tilting crucible furnace. Pouring lip is located in the axis of tilting providing a constant pouring arc regardless of degree of furnace tilt. Capacities up to #800 crucible with brass, up to #1000 crucible with aluminum. Oil or gas fired. Described in Bulletin 57-A.

Lindberg-Fisher Electric Resistance Melting and Holding Furnace equipped with heavy duty resistance elements which give uniform distribution of heat, insuring long element and pot life. Capacities 250 to #1000 crucible.

For Non-Ferrous Metals

A complete line of

LINDBERG FISHER

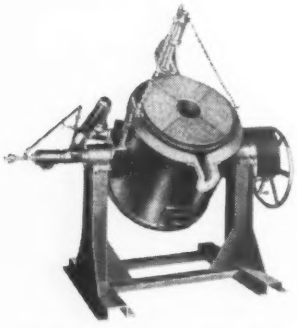


Lindberg-Fisher Simplex Rotary Open-Flame Furnace. Capacities to 2400 lbs. aluminum. 6000 lbs. brass. Oil or gas fired. Described in Bulletin 29-A.

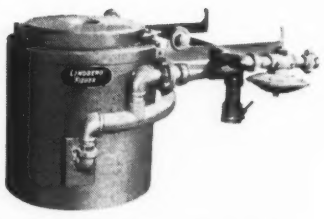
MELTING AND HOLDING FURNACES

For Melting Aluminum • brass • yellow brass bronze • copper • copper nickel alloys • lead magnesium • nickel • tin • zinc.

Because Lindberg-Fisher builds *all* kinds of melting equipment . . . gas . . . oil . . . electric . . . induction, and Carbon arc . . . L-F engineers are able to recommend, without prejudice, the proper type of furnace for *your* particular melting requirements.



Lindberg-Fisher type BB1 Hand-Tilt Crucible Furnace. Tilting mechanism consists of a hand wheel, driven through machined worm gear and pinion reducing gears. Capacities 50 to #400 crucible. Oil or gas fired. Described in Bulletin 400.



Lindberg-Fisher type SF stationary crucible furnace features rapid melting and is recommended for general foundry casting work. Capacities 30 to #400 crucible. Oil or gas fired. Described in Bulletin 301.

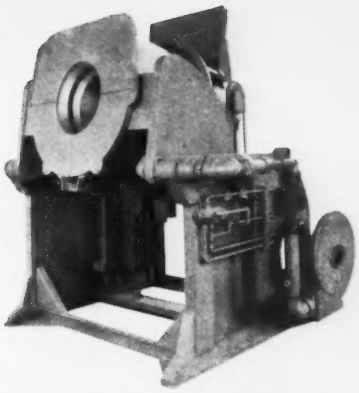
Melting specialists for 25 years

Sales and service offices in principal cities

Visit Lindberg-Fisher exhibit at the Foundry Show, May 8th through 14th, Cleveland, Ohio

LINDBERG FISHER MELTING FURNACES

A Division of Lindberg Engineering Company, 2453 West Hubbard Street • Chicago 12 • Illinois



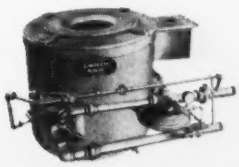
Lindberg-Fisher type HNP Hydraulic Nose-Pour Tilting Crucible Furnace. Pouring lip is located in the axis of tilting providing a constant pouring arc regardless of degree of furnace tilt. Capacities up to 1000 lbs. of aluminum. Oil or gas fired. Described in Bulletin 57-A.

For Permanent Mold Castings

A complete line of

LINDBERG FISHER

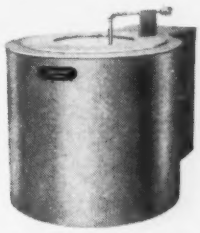
ALUMINUM MELTING and HOLDING FURNACES



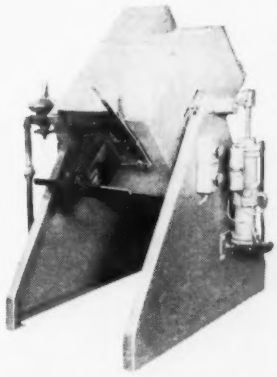
Lindberg-Fisher type ADC Aluminum Melting and Holding Furnace. Capacities up to 1000 lbs. of aluminum. Oil or gas fired. Described in Bulletin 301.

Lindberg-Fisher manufactures all types of Aluminum Melting and Holding Furnaces for permanent mold application—Gas-Oil-Electric resistance.

Lindberg-Fisher engineers can intelligently recommend the type of furnace to best suit your needs and conditions.



Lindberg-Fisher Electric Resistance Aluminum Melting and Holding Furnace equipped with heavy duty resistance elements which give uniform distribution of heat, insuring long element and pot life. Capacities up to 1000 lbs. of aluminum.



Lindberg-Wessel Casting Machine produces quality aluminum castings on a semi-automatic basis using either graphite or steel molds which are attached to the machine. Described in Bulletin LW.

Melting specialists for 25 years
Sales and service offices in principal cities

LINDBERG FISHER **MELTING FURNACES**

A Division of Lindberg Engineering Company, 2453 West Hubbard Street • Chicago 12 • Illinois

(*Continued from page* 351)
quired for blowing. The dry blended sand-resin mixtures do not produce a uniformly bonded shell mold or core.

The machine to produce blown shells requires only two stations—a blowing station and a stripping station. All operations can be made automatic and are such that cyclic action is possible.

Fig. 2 shows the outside of the back-up plate with circular heating elements attached. Centrally located is the spring-loaded blow tube connected to an airtight sand tube. Raising of the die assembly engages the blow tube as seen in Fig. 3. This operation opens the tube and allows the sand mixture to be blown into the cavity. During the process of moving the die from the blowing station to the stripping station, the shell is cured.

Fig. 4 shows a front view of the pattern and back-up plate after the stripping mechanism has lifted the back-up plate free from the pattern and blown shell. During this operation the cured shell has been stripped from the pattern. On the left side of the back-up plate and the right side of the pattern plate are located temperature control devices, the action of which is initiated by imbedded thermocouples.

Fig. 5 shows the back-up plate tilted away from the pattern to facilitate shell removal, cleaning and coating of the die halves. The shell has been stripped from the pattern and is resting on the stripping pins ready for removal. The hole through which the sand-resin mixture is blown is seen in the center of the tilted, back-up plate.

The completed shells are shown in Fig. 6 and exhibit uniform contour and sharp corners.

Enumerates Advantages

The advantages of blowing shell molds and cores with a coated sand are as follows:

1. The percentage of resin in coated sand is usually lower than that employed in uncoated sand. Coating of sand can be accomplished with conventional foundry mixing equipment.

2. The thickness of the shell mold and core can be controlled by the shape and contour of the back-up plate. In this method of blowing shells it is possible to secure any thickness that may be desired on sharp corners, vertical or horizontal surfaces. In cases where it is desirable to have shells thicker in one part than in another because of the metal mass that may be contained in one portion of the mold, such shells may be easily obtained.

3. Smooth and dense shells are produced. In blowing, the sand-resin mixture is forced into the mold cavity under pressure, rather than by gravity, and the resulting shell is both dense and strong.

4. Curing time is reduced. Since the sand-resin mixture is blown into a cavity that is heated on both sides, the curing time is shortened, but at the same time the curing is uniform throughout the shell which results in minimum warpage.

5. Sand-resin mixture consumption is minimized. By blowing, only the shell that is actually required is produced, thereby eliminating waste of the mixture.

6. The use of pastes, clamps and back-up materials is, in most cases, eliminated. In the blowing of shell molds, it is possible to produce almost any contour on the back of the shells that may be necessary in order to obtain a flat surface or projecting bosses. These flat surfaces may be formed to a common plane, and

(*Concluded on page* 356)

3 IMPORTANT FEATURES of
FOX
Swing Frame
GRINDERS

- **Perfect center balance** of wheel and motor ensures grinding ease and efficiency.
- **"Worker safety"** is carefully provided.
- **Greasing** required only once every six months . . . guaranteed for two years against repairs, exclusive of electrical equipment.

FOX GRINDERS, Inc.

OLIVER BUILDING **PITTSBURGH 22, PA.**

AJAX

LO-VEYORS on parade

at the FOUNDRY SHOW in Cleveland Booth 1612 Lower Lakeside Hall

AJAX LO-VEYORS are being welcomed throughout the foundry industry as the cost saving successors to shovels, wheelbarrows and expensive unskilled labor.

AJAX LO-VEYORS are used in custom as well as high production foundries.

AJAX LO-VEYORS are being installed on or below the floor. They can be arranged for dual functions including conveying sand and sorting tramp iron and core rods.

Typical Ajax Lo-Veyor handling spill sand from molding lines in a large foundry. This unit is 55' long, made in a single section with saddle-mounted drive unit. No exposed rotating bearings,—ideal for use under abrasive conditions.

FOUNDRY EQUIPMENT MEMBER FEMA MANUFACTURERS ASSOCIATION INC.

AJAX LO-VEYORS are used as component parts by America's leading manufacturers of foundry equipment as well as by individual foundries who are awake to today's importance of cutting down non-productive labor costs.

It will pay you to see Ajax Lo-Veyors at the Show.

AJAX FLEXIBLE COUPLING CO. INC.

Representatives in Principal Cities

WESTFIELD, N. Y.

Ideal for use in foundries and small metal producing plants, these machines provide exceptional economy and durability due to a unique design feature. The endless chain carrying the mounds runs over a series of "stationary wheels" mounted on the frame, rather than in the chain as on conventional units. This keeps the wheels as far as possible from the hot metal and eliminates 80% of the moving parts. Results are increased capacity and a substantial reduction in maintenance and operating costs. Capacities: 3 to 50 tons per hour. Lengths: 15 to 125 feet, in multiples of 5 feet.

WILLIAM M. Bailey COMPANY
ENGINEERS
LEADERSHIP THROUGH QUALITY
1221 BANKSVILLE ROAD PITTSBURGH 16, PA.

(*Concluded from page* 354)

thus the molds may be stacked horizontally, one upon the other, for stack molding, or they may be poured one at a time in a horizontal plane using a conventional mold weight to effectively hold the shell halves together. Shell molds can also be booked and poured vertically, using only end supports. The flat planes or projection points on the back of the shell molds may be placed in such a manner as to provide sufficient bearing surface as dictated by the castings being produced; thus no additional or expensive equipment is needed to pour off blown shells.

7. By virtue of the contoured back, shell molds can be employed as expendable liners in centrifugal and permanent molds.

Michigan To Conduct Cast Metal Courses

University of Michigan, Ann Arbor, Mich., has announced two, one-week, intensive courses for design engineers, foundrymen and metallurgists to be offered from Aug. 9 through Aug. 20.

The first course is for those interested in the latest information on the properties of all the important cast metals and the correlation of properties with microstructure, melting practice and heat treatment. Registration will be limited to 20 to permit individual attention in the laboratory sessions.

The second course will concentrate on the applications of the cast metals in the automotive, aircraft, chemical, machine tool, mining, ordnance, power, railroad and other key industries. Registration will be limited to 40.

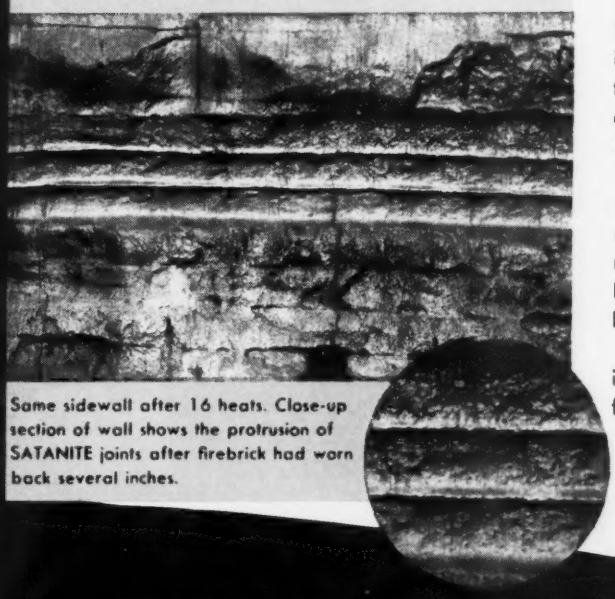
Fee for the first course is $90 and for the second course is $60. Fees must be paid at time of registration. Registrations must be completed by June 5 and will be accepted in company names so that individual participants may be chosen later. Housing accommodations will be available at the Michigan Union at rates of $4 per day and up.

FEMA Publishes Yearbook

The Foundry Equipment Manufacturers Association has released its annual yearbook containing lists of the officers, both current and past, directors and committees, membership roster and a listing of the membership by product classification.

AFTER 16 HEATS...SATANITE JOINTS PROTRUDE BEYOND THE FIREBRICK SIDEWALLS

EMPIRE firebrick sidewall of malleable air furnace laid up with A. P. Green SATANITE. Note the thin brick-to-brick joints.



Same sidewall after 16 heats. Close-up section of wall shows the protrusion of SATANITE joints after firebrick had worn back several inches.

SATANITE JOINTS PROVIDE LONGER RUNS, INCREASED PRODUCTION, LOWER REFRACTORY COSTS

A large midwestern foundry reports excellent results from furnaces in which A. P. Green SATANITE slag resisting mortar was used in laying up the sidewalls. The above photographs clearly tell the story. A sidewall is shown immediately following installation and after 16 heats.

Note that after 16 heats, although the firebrick attacked by flame, slag and molten metal, has worn back several inches, the SATANITE joints still protrude ⅛ to ¼ inch beyond the surface. This enables the wall to wear back evenly and give added joint protection. Protection that pays off in lower refractory cost, longer runs and increased production.

In malleable air furnaces where sidewalls and bottom are laid up with SATANITE, any part of them can be easily removed for patching or rebuilding. Use SATANITE bonding mortar to increase the life of the lining in all types of malleable iron air furnaces, ladles, electric furnaces, cupolas, and hot metal mixers. Packed in 100-pound multi-wall bags.

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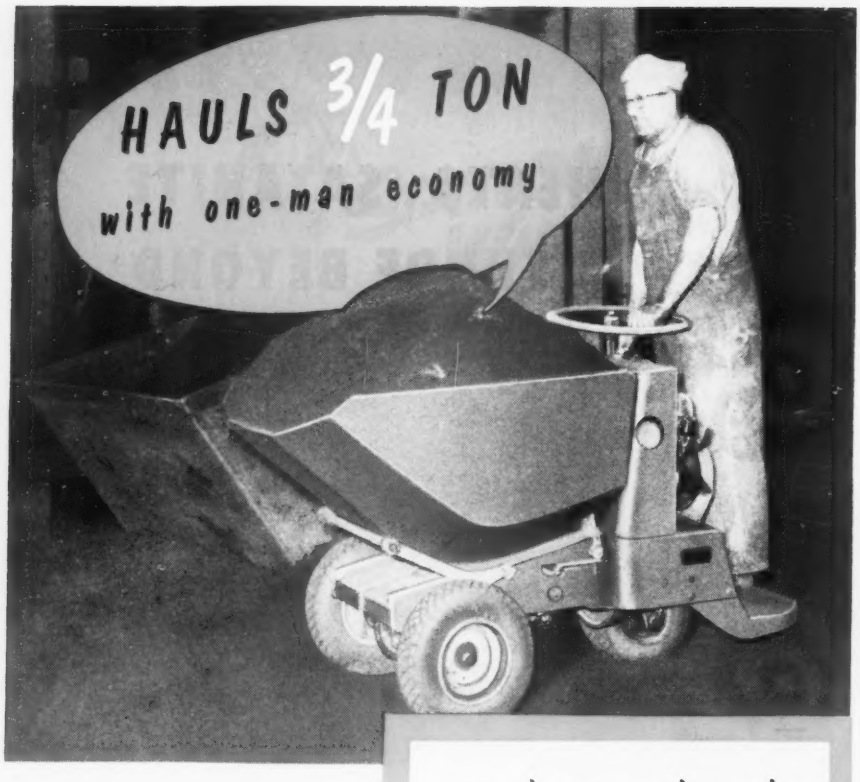

Shuttling between mixers and molding stations, and from shake-out floor to cleaning room and storage, Kwik-Mix Moto-Bug moves ¾-ton loads with one-man material-handling economy. As a power wheelbarrow, this low-cost foundry handyman hauls coke, core and molding sand . . . cleans up slag and scrap around ovens, shops and yards. Change to flat-bed platform, or 5-ft. fork lift, and Moto-Bug handles flasks, cores, finished castings. Check the *big savings* you can earn with a *small investment* in Moto-Bug. See Kwik-Mix distributor for a demonstration, or write us.

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Send us full details on Moto-Bug with:

☐ hopper ☐ platform ☐ fork lift ☐ scraper

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CO. .....
DIV. .....
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CITY, STATE .....

KWIK-MIX (Koehring Subsidiary) "NO PUSH — NO PULL" **Moto-Bug**

M. F. Pendergast Retires from Whiting Corp.

Last year, after 26 years of service, in the course of which he supervised the erection of a great number of cupolas in all parts of the United States, Martin F. Pendergast retired from his work with the Whiting Corp., Harvey, Ill. Among the installations he directed are those of four cupolas at the Dodge Division, Chrysler Corp., foundry, Detroit, and six at the foundry of Buick Motor Division, General Motors Corp., Flint, Mich.

Mr. Pendergast was born Oct. 20, 1887, in Cold Spring, N. Y. At the age of 17, he started serving his apprenticeship as a molder at West Point Foundry, Cold Spring. Four years later, his apprenticeship finished, he took to the road and worked in several foundries until 1916. In that year, he entered the United States Army, in which he served till 1919. After association with a number of New York state foundries, he joined the Whiting Corp. in 1927, as a field service man.

Made Unusual Installations

With Whiting, Mr. Pendergast made some unusual cupola installations, such as on the eighth floor of the Brooklyn (N. Y.) Technical High School and in the Washington, D. C., penal institution at Lorton, Va. At San Diego, Calif., he supervised erection of a cupola at the U. S. Naval Training Station. On this assignment, he not only erected the cupola, but also supervised its operation and the preparation of molds for machine shop equipment. The work was done by young Navy men.

On one of his missions to help Billard Machine & Tool Co., Mansfield, Pa., solve a problem, Mr. Pendergast, who is better known as "Pendy" to his multitude of foundrymen friends, was asked to give a talk to the employees after he had located the difficulty. After the foreman frequently used the word "can't" in introducing him, "Pendy" said shortly, "This is America. There is no such thing as 'can't.' The man who says he can't had better step aside; there is a man right behind him who will do it."

Many of "Pendy's" friends will

(*Concluded on page* 360)

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Columbium . . Ferrocolumbium and Ferrotantalum-Columbium.

Manganese . . Standard Ferromanganese, Low- and Medium-Carbon Ferromanganese, Low-Iron Ferromanganese, "Mansiloy" Alloy, Manganese Metal, and other Manganese Alloys.

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Zirconium . . 12 to 15% and 35 to 40% Zirconium Alloys, and Nickel-Zirconium.

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(*Concluded from page* 358)

remember his visits to their foundries as they wish him a long and pleasant retirement. Correspondence should be sent to 336 Milton Ave., Ballston Spa, Saratoga County, N. Y.

Study Foundry Conditions to Reduce Eye Injuries

Results of a study made by the National Society for the Prevention of Blindness in co-operation with the Gray Iron Founders' Society is reported in a booklet entitled "Sight Conservation in Gray Iron Foundries."

The report indicates that 95 per cent of industrial eye injuries can be prevented through use of proved safety methods and equipment and that resulting benefits to management and employees will offset any expenditure of time and money.

The study is intended to call to the attention of foundry managers the conditions and practices that are hazardous to eyesight in the hope they will take immediate steps to eliminate the present incalculable amount of human suffering and economic loss.

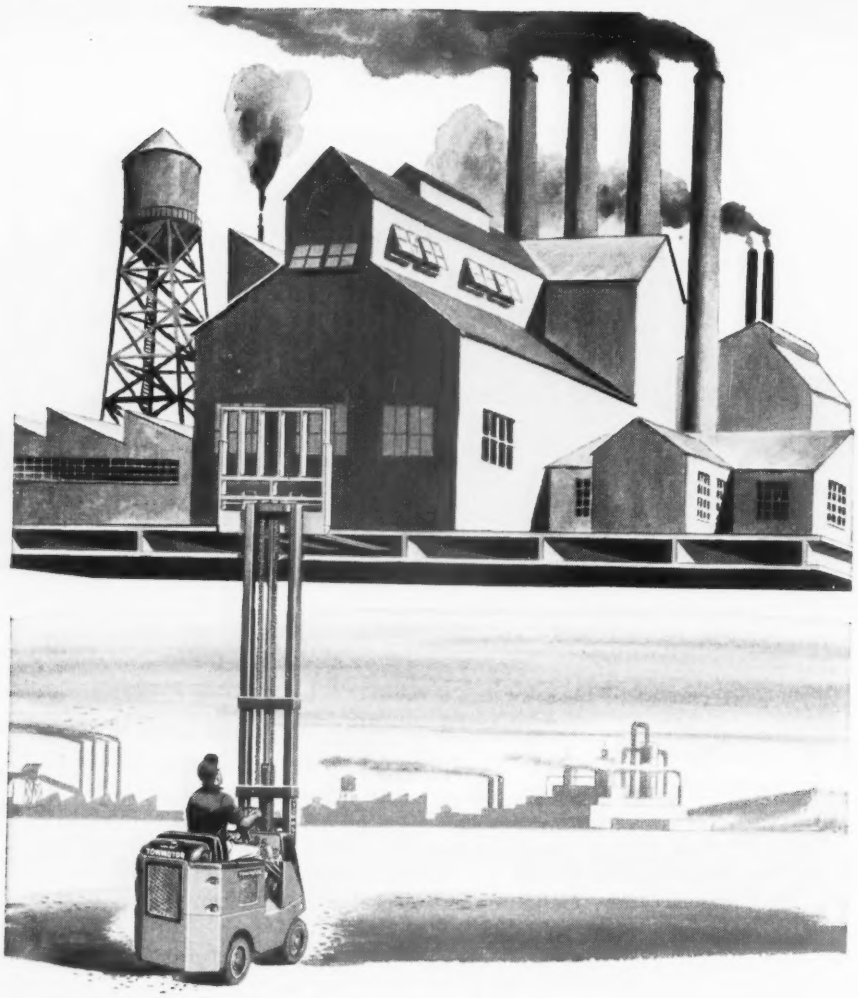
A limited supply of single copies of the booklet, which includes recommendations intended to establish eye protection standards and sound operating safety programs, are available through the Gray Iron Founders' Society, Cleveland 14.

Book Review

Mechanics of Materials, by Philip G. Larson and William J. Cox, cloth, 414 pages, 6 x 9 in., published by John Wiley & Sons Inc., 440 Fourth Ave., New York 16. Price $5.75.

This book was first published in 1938 and since then has won a reputation both as a reference work and text. Now in its third edition, it retains much of the outlook of the earlier editions but has been rewritten to add to its clarity and timeliness, with increased emphasis on the statics of stress determination.

The purpose of the book, according to the authors, is to provide a clear understanding of the fundamental principles underlying machine and structural design. To accomplish this they examine the physical behavior of stressed bodies, not merely from the viewpoint of its mathematical expression, but also in the light of the practical problems that confront the engineer. The material is presented in a manner that is easily understood. Statements are expressed clearly and supported with explanations. The reader is encouraged to think of the subject matter in terms of its engineering realities.



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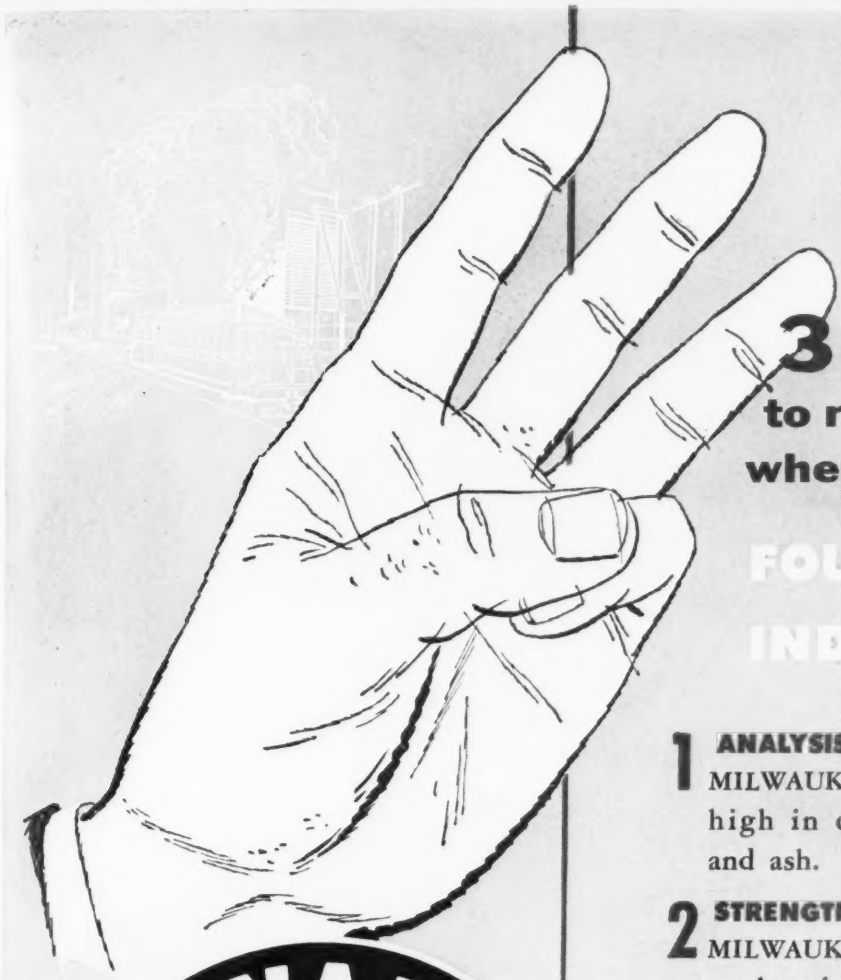

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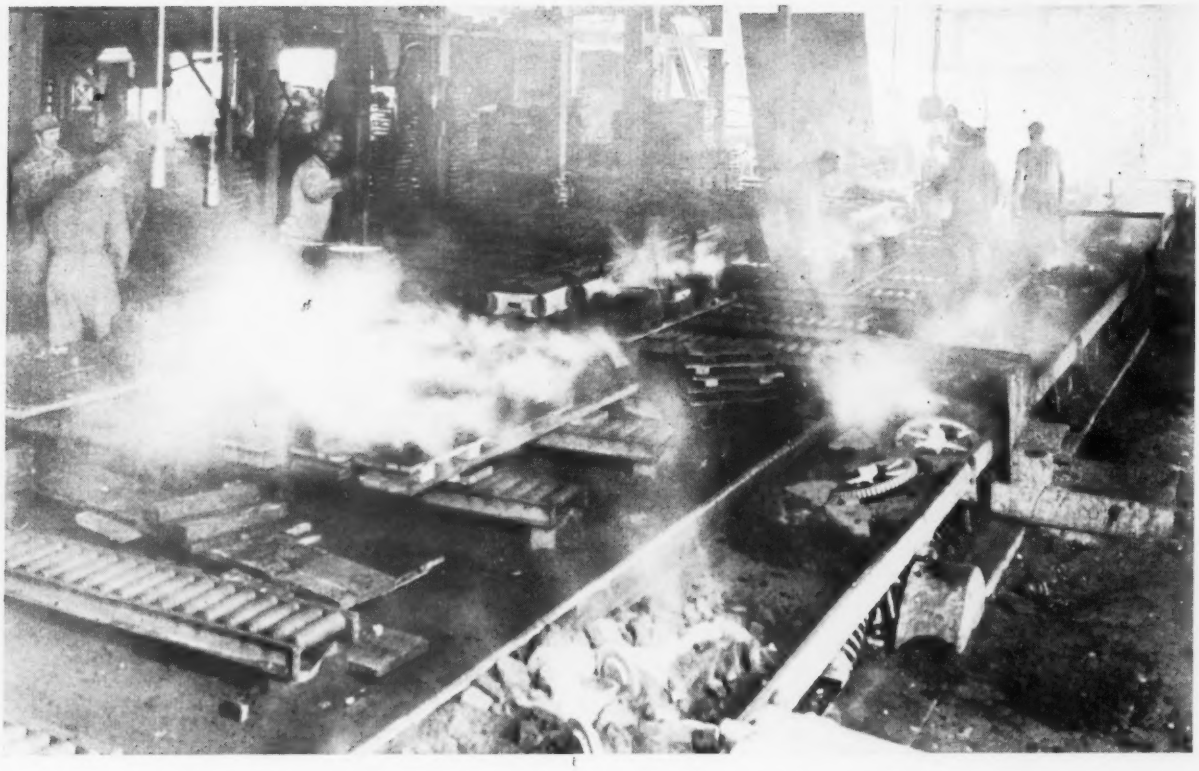
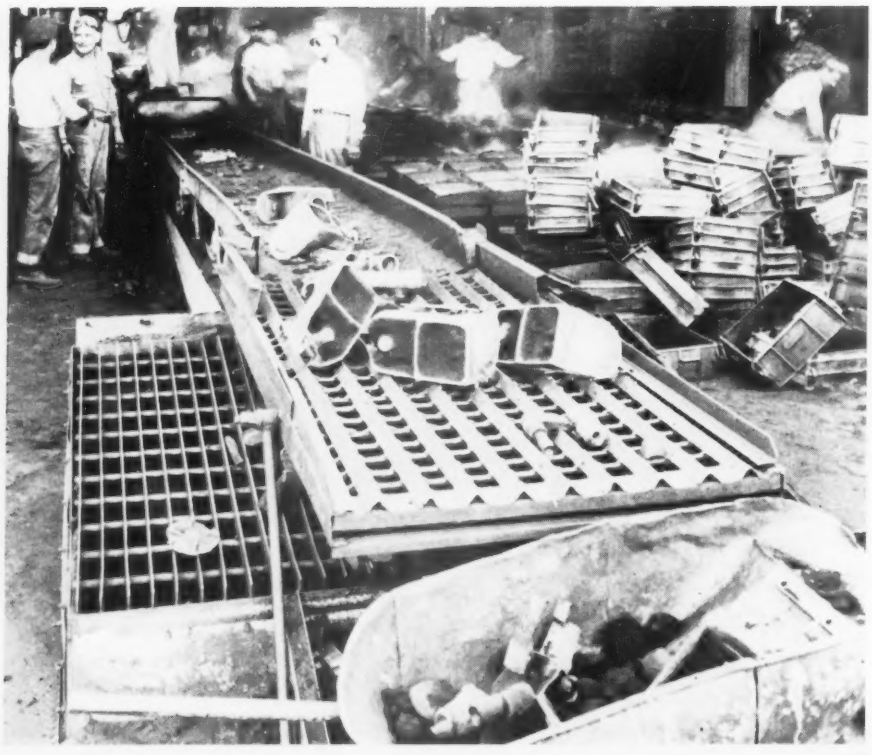


Vibrating conveyor extends length of pouring floor. Molds are placed on roller conveyors for pouring. Note the overhead system for handling the pouring ladles

Mechanical Handling

Raises Foundry's Efficiency

By FRANCIS A. WESTBROOK



This illustration shows vibrating conveyor with the grizzly in foreground. (Photos courtesy Stephens-Adamson Mfg. Co.)

THE Howell Foundry Co., in Los Nietos, Calif., a short time ago installed a system of two vibrating conveyors to shake out the sand from castings, plus other modern handling equipment. The equipment has proved to be an important saver of time and labor.

Prior to this modernization the company operated a typical jobbing foundry in which the molders carried their molds and placed them on the floor. In the afternoon they would start the heat and pour off for about three hours. A shakeout crew of five men worked at night. They dumped the poured molds, piled bottom boards, knocked sand from the castings and wheeled them from the molding area into the cleaning room.

(*Continued on page* 364)

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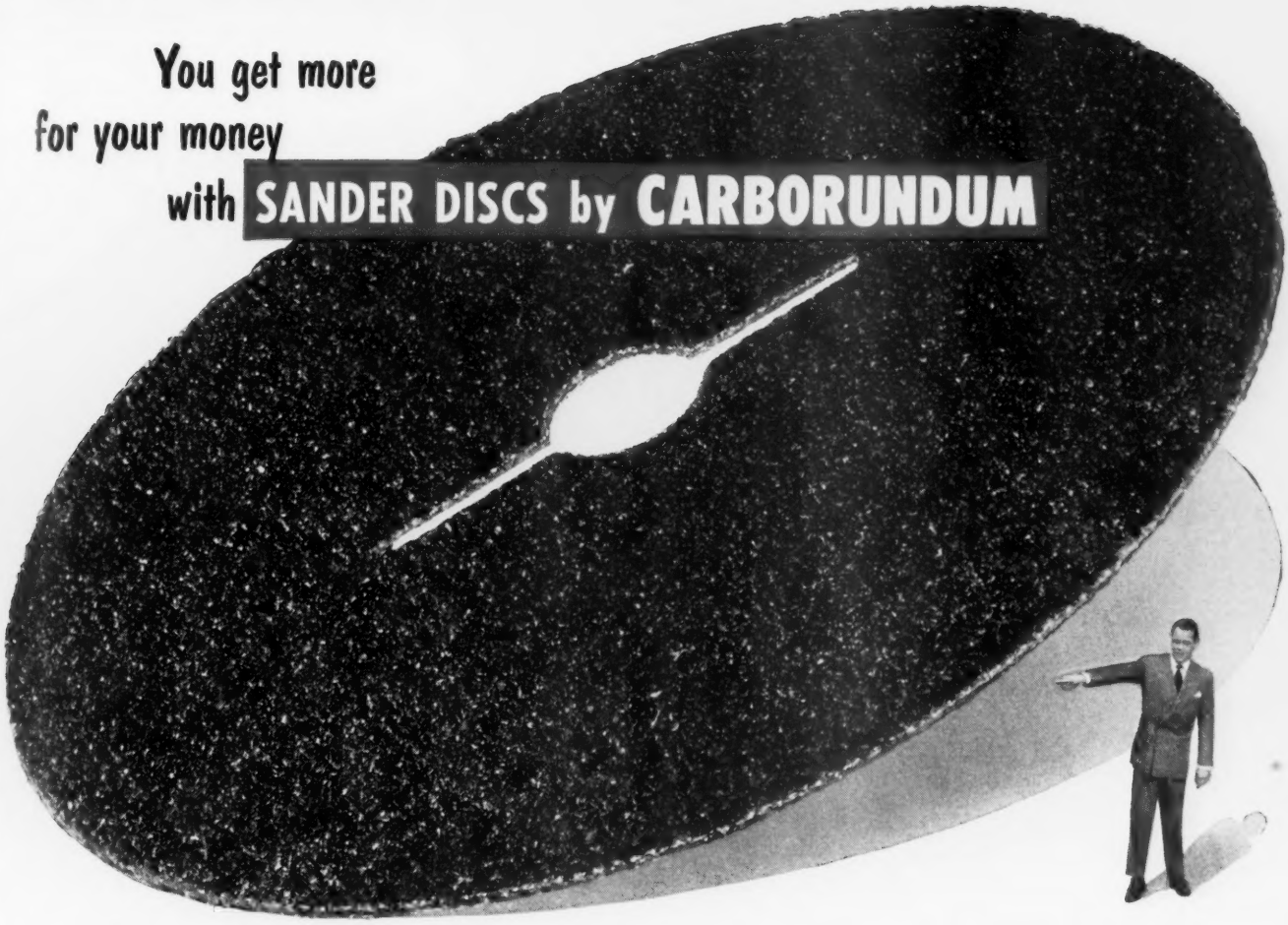

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LONG LIFE	Sander Discs by CARBORUNDUM last just a little longer because of their tough fibre combination backings and the special resin bond which holds the grain. A few minutes more per disc soon adds up to impressive savings.
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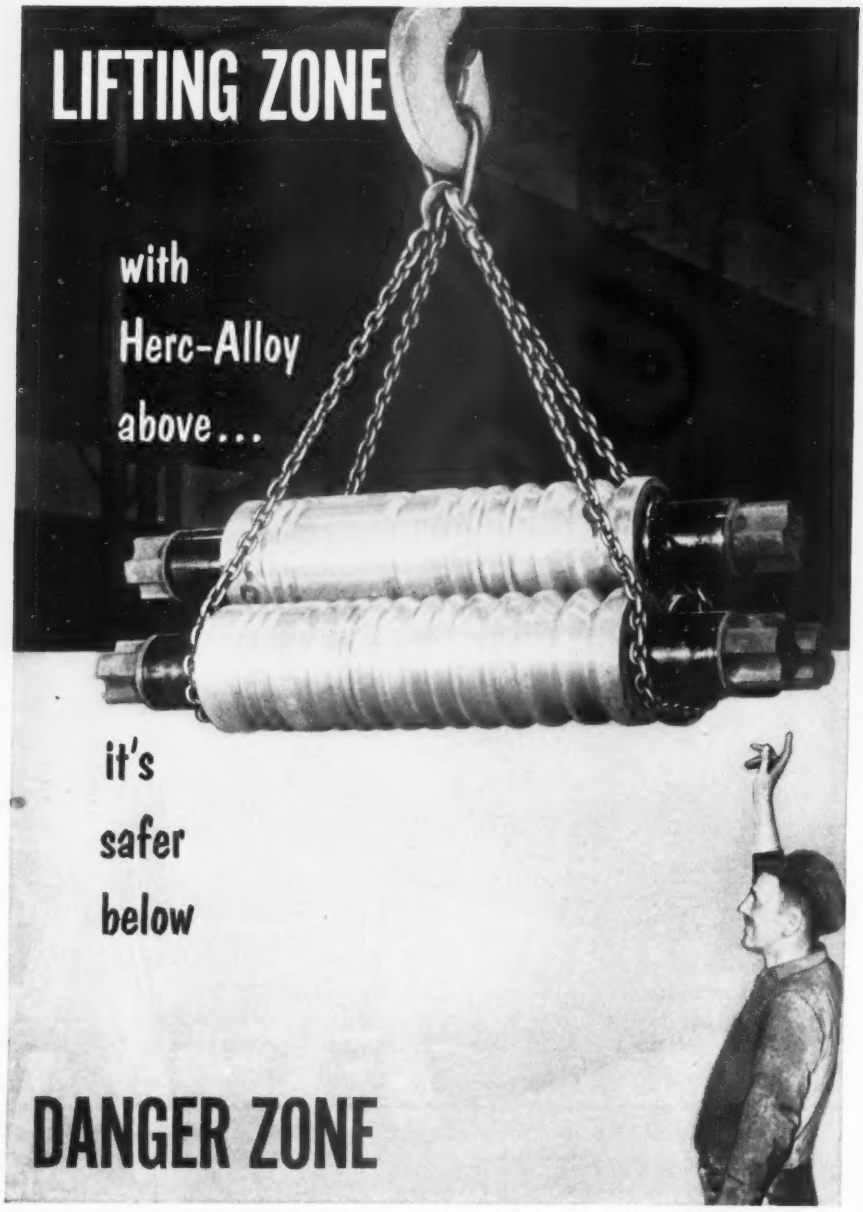
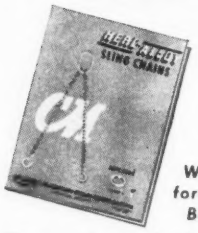


SPECIFY

HERC-ALLOY

SLING CHAINS



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Sling Chains are registered by individual serial number and can be rebuilt or replaced at any time to original specifications.

The Allegheny Ludlum Steel Corp., pictured above, uses Herc-Alloy Sling Chains for hundreds of tough lifting jobs in its plants. In addition to maximum safety, Allegheny Ludlum also enjoys the extra economy of longer-lasting Herc-Alloy. These sling chains offer still another advantage...a weight reduction unmatched by any other alloy chain without any sacrifice in tensile strength. This reduces worker fatigue. All things considered, don't you think Herc-Alloy Sling Chains are worth a try in your plant.

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(*Continued from page* 36-)

then wet down the sand and cut it through in preparation for the next day's molding.

Now there is a sand bin over each molder's station from which prepared sand is discharged into the flask without shoveling or riddling. The completed molds go on roller conveyors where they are poured from ladles hanging from an overhead crane system. Poured molds are then dumped manually on the vibrating conveyor.

This vibrating conveyor consists of two sections, each 45 feet long placed end to end along the pouring room floor. Each is driven by a 5-hp motor. The trough of the first conveyor section is 28 inches wide and discharges into the trough of the second section, which is 30 inches wide. Both troughs are 6 inches deep.

Vibration of the conveyor separates the sand from the castings as they travel along, and the heat is dissipated so rapidly that the trough does not get too hot to touch and the sand is also cooled considerably in transit.

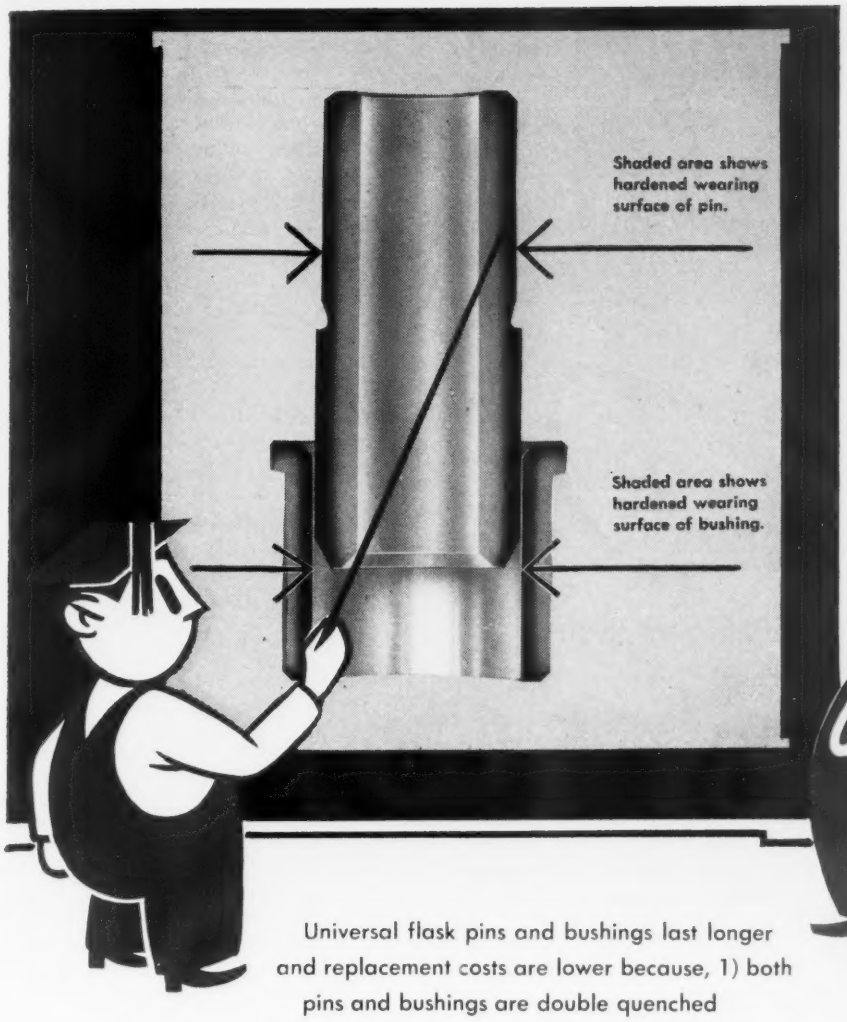
Castings Vibrated Effectively

At the end of the vibrating conveyor system is a vibrating shakeout grizzly made by the company of parallel angle irons on top of cross bars, the whole being welded to the end of the conveyor. A single cross angle iron at about the mid-length of the grizzly holds back the castings briefly so that the extra shaking helps to remove any sand that may remain. In fact, the whole vibrating operation is so effective that more than 80 per cent of the castings come out with the gates removed.

After the sand drops through the grizzly it passes over a magnetic pulley, through a system of screens and then into an elevated storage. Sand is discharged from storage into a muller where bond and moisture are added. It is then discharged and conveyed by belt conveyor to the sand hoppers above each molding station.

Molding operations have been speeded up about 30 per cent and, of course, molding production was increased another 25 per cent because the machine operators mold all day instead of pouring some 30 per cent of the work day as formerly. It is hard to determine just how much labor has been saved, but the overall labor cost is 8 per cent less than it used to be. Also, much less sand is purchased than before the modernization was carried out.

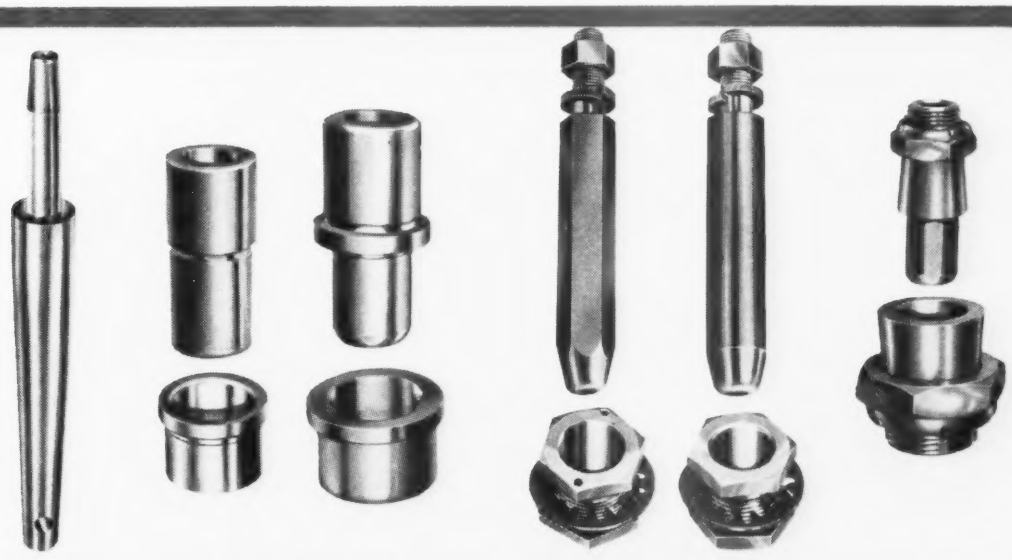
(*Concluded on page* 366)



how the long life of UNIVERSAL flask pins and bushings saves dollars in your foundry operations

Universal flask pins and bushings last longer and replacement costs are lower because, 1) both pins and bushings are double quenched and double drawn to produce strong, ductile cores that can take rough treatment in the foundry without breaking or chipping and, 2) wearing surfaces are carburized and hardened to withstand wear. Universal flask pins and bushings are precision ground to insure instant, accurate alignment of cope and drag. For complete information, write to Universal Engineering Sales Co., 1060 Broad St., Newark 2, N.J.; 5035 Sixth Ave., Kenosha, Wis.; or the home office.

185



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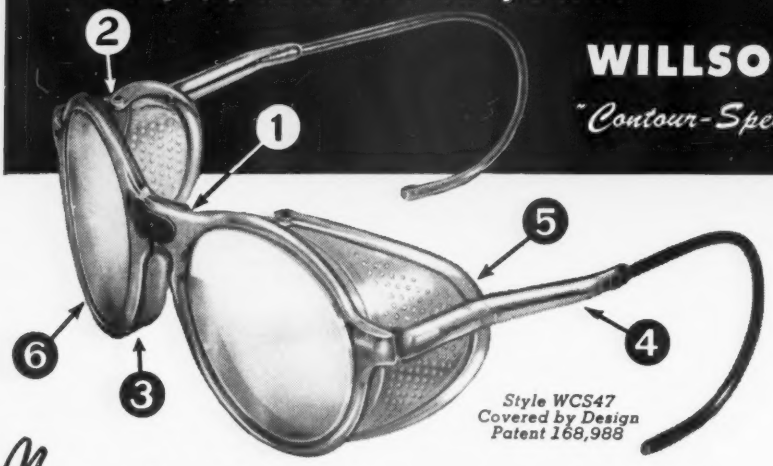

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New... hinged bridge gives snug, comfortable fit... self-adjusting to *any* facial contour!

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2. **One all-purpose size** permits universal fit. Bridge hinge gives automatic adjustment to any bridge width from 18-26 mm.; one eye size—47 mm.—fits everybody. *No need to stock a variety of bridge and eye sizes.*
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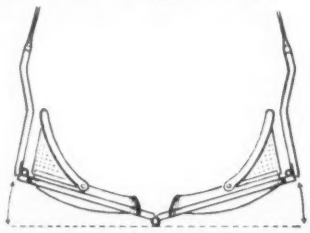
6. **Butyrate frame**—*toughest plastic used for spectacles.* Standard frame is flesh colored, fitted with 6-curve Willson Super-Tough® glass lenses. Available also with green frame and sideshields, fitted with Willsonite® Super-Tough green glass lenses.

Hinged to fit any face snugly!

See how the unique hinged bridge allows the Contour-Spec to open up to fit broad faces and close up for narrow faces. It's this feature that allows Contour-Specs to contact the entire eye cavity and makes them fit so comfortably yet securely.



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More Than 300 Safety Products Carry This Famous Trademark

WILLSON*

Established 1870

WILLSON PRODUCTS, INC., 237 Washington St., Reading, Pennsylvania

(*Concluded from page* 364)

The vibrating conveyor is an important and interesting feature of the mechanical handling system. It handles the hot castings and abrasive sand without undue wear, and the coil springs are designed to vibrate naturally at the frequency desired for the operation of the conveyor, thus making for minimum power consumption. A standard induction motor is suitable, with the speed reduced by V-belt drive to the eccentric at the natural frequency of the springs. There is also a hydraulic dash pot on the drive lever to cushion the peaks of starting overloads; it becomes inactive when the conveyor has reached operating frequency, except for compensating for load variations on the trough.

Stainless Output at Peak

Stainless steel production figures for 1953 show an all-time high output of 1,015,303 tons, according to the American Iron and Steel Institute. These figures are based on reports by 20 producers, which in 1953 represented 97.1 per cent of the total output of stainless steel ingots.

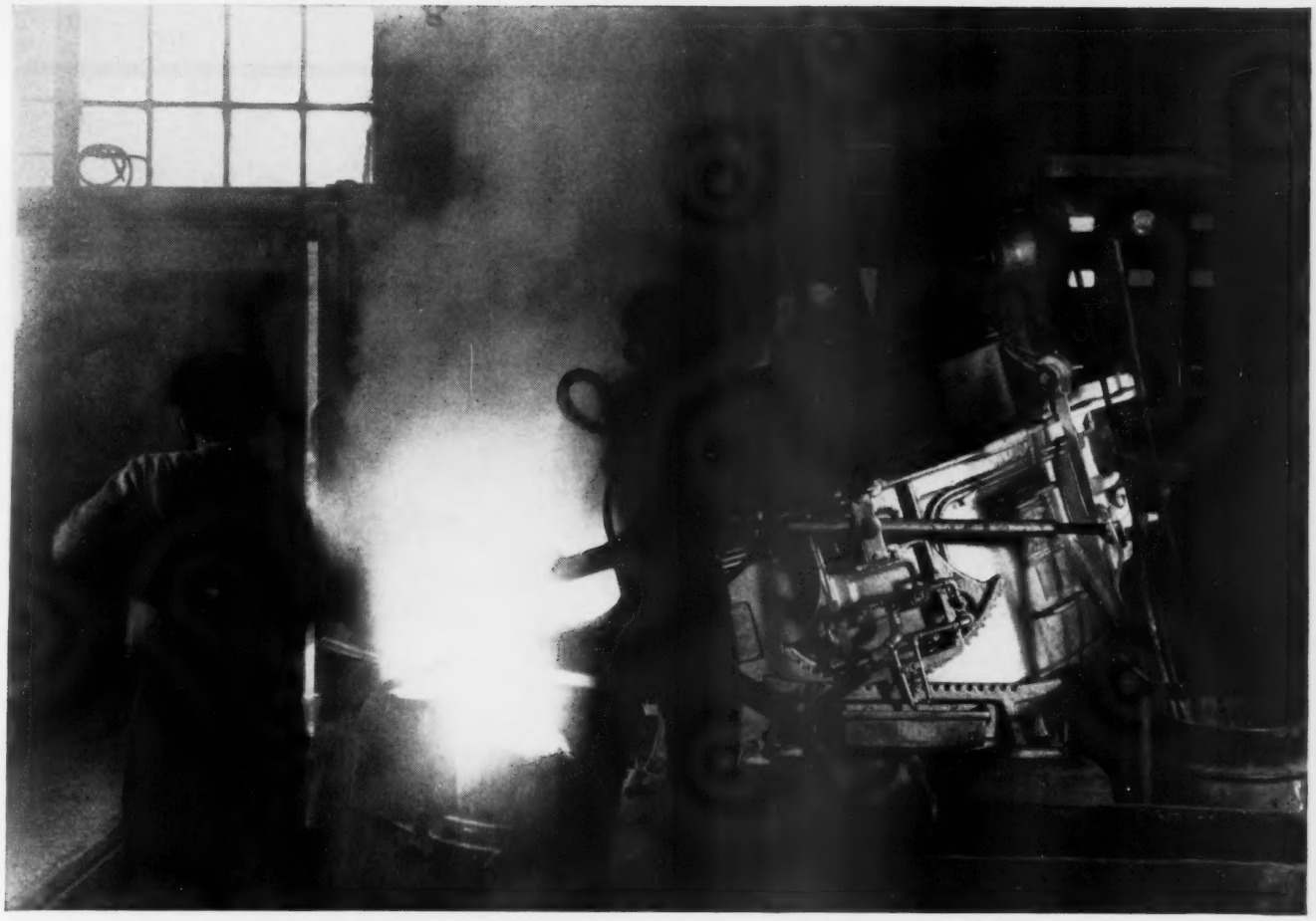
A net increase of 85,139 tons over 1952 production was achieved despite an 11 per cent decline in shipments to the aviation industry and a 31 per cent drop in government business. Wider use of stainless steels in other industries accounted for the increases, according to the institute. Stainless in the architectural field was up 47 per cent and the automotive industry increased its use of stainless by more than 100 per cent over 1952.

Book Review

Modern Electroplating, edited by Allen G. Gray, cloth, 563 pages, 6 x 9 in., published by John Wiley & Sons Inc., New York. Price $8.50.

Sponsored by the Electrochemical Society Inc. and written by 39 experts, this volume is a completely modernized revision of an earlier book with the same title. It comprises an excellent source of present-day commercial electroplating processes and the basic theory underlying those practices.

First chapter discusses general principles while the second describes methods of control. Remaining chapters relate to alloy plating, brass, cadmium, chromium, cobalt, copper, gold, indium, iron, lead, nickel, platinum group, silver, tin, zinc, uncommon metals, plating on aluminum and magnesium, with an appendix of useful tables and information.



Duplexing in this Lectromelt Furnace gives castings specified wear, heat and pressure resistance.

"Specials are routine . . . with our *Lectromelt** Furnace"

"Special irons for special castings are routine production in our plant," says one gray iron foundry plant engineer. "The electric furnace process is the only way to produce irons that will meet the tensile strength and machinability requirements that our customers need in special castings," his chief metallurgist added.

The furnace being talked about was a Lectromelt. And the results are typical of the precise control Lectromelt Furnaces make possible. Whether you're working with irons, semi-steels or alloy steels, a Lectromelt Furnace will give you precise control at costs often comparable to cupola melting . . . yet, with unmatched flexibility.

Laborsaving, top-charging Lectromelt Furnaces provide such control at low cost whether for melting, smelting, refining or reduction. Our engineers will gladly discuss means of cutting costs for these operations without cutting quality. Write, Pittsburgh Lectromelt Furnace Corporation, 314 32nd Street, Pittsburgh 30, Pa.

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*REG. T. M. U. S. PAT. OFF.

MOORE RAPID

WHEN YOU MELT... *Lectromelt*

ACTIVITIES OF FOUNDRY GROUPS

NORTHEASTERN OHIO Chapter of the AFS marked national officers night Mar. 11 at the Tudor Arms Hotel, Cleveland. Top view, left to right, are J. F. Roth, Cleveland Standard Pattern Works, pattern session chairman; Charles A. Licht, Apex Smelting Co.; Stephen E. Kelly, Eberhard Mfg. Co., chapter chairman; H. F. Scobie, *American Foundryman*; E. Claude Jeter, Ford Cleveland Foundry, chapter director; Charles F. Walton, Case Institute of Technology, general session chairman, and Robert H. Zoller, Zoller Casting Co., Bettsville, O., general session speaker. Bottom view, left to right, are Mr. Jacobsen, Zoller Casting Co.; Frank Cech, Cleveland Trade School, immediate past chairman of the chapter; David Clark, Forest City Foundries Co., first vice president of the chapter; J. T. MacKenzie, American Cast Iron Pipe Co., Birmingham, national AFS director; William W. Maloney, AFS secretary-treasurer; Hans J. Heine, AFS acting technical director; M. K. Young, U. S. Gypsum Co., the pattern session speaker, and J. T. Mathison, U. S. Gypsum Co. Photos by Sterling Farmer, Sand Products Corp.

Northeastern Ohio

MORE than 200 foundrymen attended the Mar. 11 National Officers Night meeting held by Northeastern Ohio Chapter of the AFS at the Tudor Arms Hotel, Cleveland. Stephen E. Kelly, Eberhard Mfg. Co., chapter chairman, presided.

Special guests included Dr. J. T. MacKenzie, American Cast Iron Pipe Co., Birmingham, national director of AFS and retiring president of the Foundry Educational Foundation; William W. Maloney, AFS secretary-treasurer, and Hans J. Heine, AFS acting technical director.

Dr. MacKenzie spoke briefly and extended greetings from the AFS, FEF and the Birmingham chapter. Mr. Maloney reported on progress of the AFS headquarters building which is expected to be occupied late in July or early August. Mr. Heine previewed briefly the technical program for the national convention.

Speaker at the general session was Robert H. Zoller, president of Zoller Casting Co., Bettsville, O. He described his company's experiences and the techniques developed for operation and use of a basic-lined, water-cooled cupola which requires the bottom to be dropped only once a week. Operation of the cupola was described in the September, 1953 issue of FOUNDRY in an article entitled, "Drops Cupola Bottom Once a Week." Prof. Charles F. Walton, Case Institute of Technology, was technical chairman.

Approximately 40 members of the chapter's patternmaking division gathered in a separate session to hear M. K. Young, U. S. Gypsum Co., discuss "Hydrocal Patternmaking." Mr. Young described latest types of plaster available whose characteristics greatly increase the utility of plaster as a pattern material. These plasters do not set too speedily, expand upon hardening, are very hard when dry and can be prepared to compensate for shrinkage allowance. They are particularly useful for making large patterns for short-run production for which wood or metal patterns would be too expensive, but they also have applications for patterns for plastic coreboxes, matchplates, stretch-plates for stretching aluminum and for other purposes.

John Roth, Cleveland Standard Pattern Works, was chairman of the session.—*Kenneth L. Mountain and Jack C. Miske.*

Reading

CONSIDERATION of "An Effective Accident Prevention Plan for Small Foundries" occupied members of the Reading Foundrymen's Association at the meeting held Mar. 16 at the Berkshire Hotel, Reading, Pa. Also present were 21 vocational guidance instructors from Berks county high schools and colleges who were guests of the association at this safety meeting.

The speaker, John F. Miller, is safety advisor for the Stanley G. Flagg Co., Pottstown, Pa. Anthony S. Rogers of the same company served as technical chairman.

Mr. Miller stated that the first and most important ingredient for a successful safety program in a foundry is the enthusiastic endorsement and continuing support of top management. In addition to this, top management should provide the necessary equipment for a good safety program

(*Continued on page* 371)

Increase Your Profits—

get the highest possible recovery of aluminum scrap with

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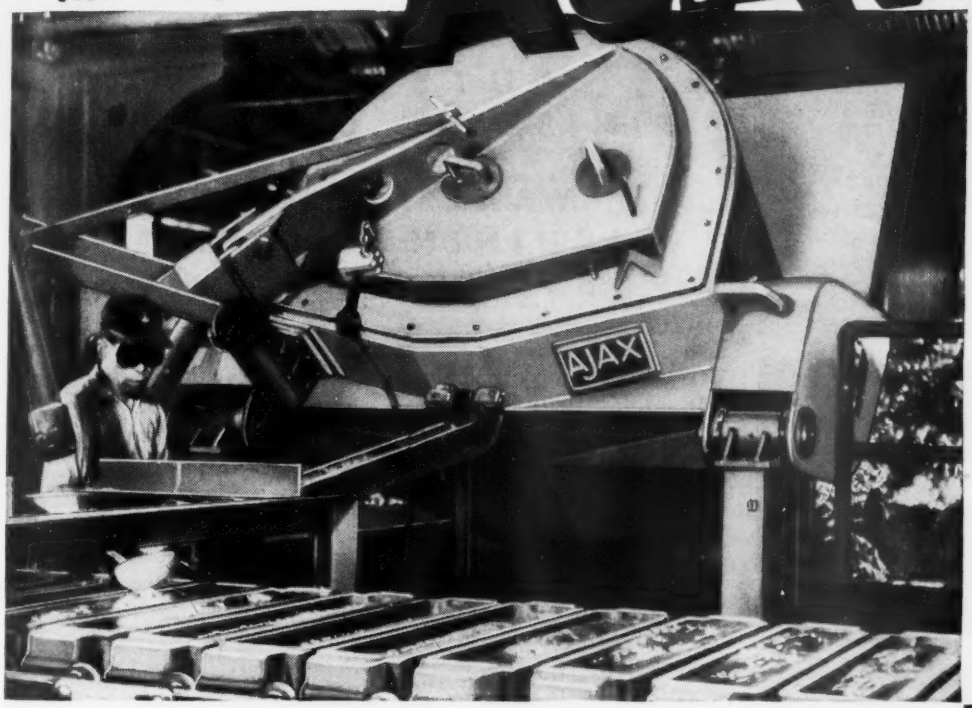
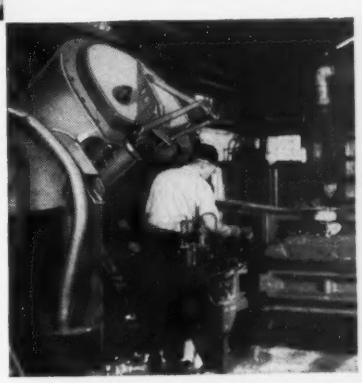


AJAX induction furnaces are used in many plants for the efficient recovery of loose scrap, such as foil, chips, borings, turnings and the like. They are also adaptable for the full range of non-ferrous metals and alloys with the same advantages obtained in aluminum, and are built in sizes ranging from 20 kW to 1400 kW.

AJAX low frequency induction furnaces will melt aluminum foil scrap with the lowest obtainable melting losses. Photo above shows an AJAX 166 kW melting furnace installed at the plant of the Toyo Aluminum Works in Yao near Osaka, Japan. Unbaled foil scrap shown at right edge of photo is remelted at the rate of about 900 pounds per hour with a recovery of 99%. Molten metal is poured into ingot molds as shown in the front of the photo. Another view of same furnace is shown in small photo at right.



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Delta Deburring Machines do a fast, high quality deburring and finishing job on castings. Delta Power Tools enable Meta-Mold to offer customers a complete machining and finishing service at "rock bottom prices."

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In foundries from coast to coast, Delta Woodworking and Metalworking Power Tools are taking big bites out of the cost of pattern making, header removal, surface finishing and machining. Their ability to handle multiple jobs cuts handwork and set-up time—their accuracy eliminates rejects—their portability provides maximum foundry pattern shop flexibility. Let your Delta Dealer prove to you that Delta Power Tools, properly used, will pay you in lower costs—higher production. He's listed under "Tools" or "Machinery" in your classified phone book. Send the coupon for full information.

DELTA QUALITY POWER TOOLS
Another Product by **Rockwell**

DELTA MILWAUKEE

DELTA QUALITY MAKES THE DIFFERENCE

(*Continued from page* 368)

such as goggles and other safety devices the job requires, as well as an adequate first-aid station with trained personnel in charge. A safety committee composed of representatives of the company and the employees is desirable. This sharing of responsibility is an effective means of enlisting the co-operation and support of employees. He also recommended a pre-employment physical examination.

According to the speaker, the foundries with a reputation for safe working conditions and good housekeeping will always attract more desirable employees.

Association President James Woodward presided at the business session and appointed the following Nominating Committee: Bruce W. Edris, Arlan L. Wentzel, with Hermann P. Good as chairman.—*William I. Cassidy*

ROCHESTER Chapter of the AFS met Mar. 2 at the Hotel Seneca, Rochester, to hear a discussion of "Brass and Bronze Foundry Practice" by Robert A. Colton, sales manager, Federated Metals Division, American Smelting & Refining Co. From left to right are Mr. Colton and Edward J. Baker, American Smelting & Refining Co., and Duncan F. Wilson, program chairman, American Brake Shoe Co.

Tennessee

PRINCIPAL speaker at the Mar. 19 meeting of Tennessee Chapter of the AFS was C. V. Nass, vice president and general manager, Beardsley & Piper Division, Pettibone Mulliken Corp., Chicago. Approximately 75 members met at Hotel Patten, Chattanooga, to hear Mr. Nass' talk on "Core Room Mechanization." W. P. Delaney, Eureka Foundry Co., Chattanooga, and chapter chairman, presided. Herman Bohr, Robbins & Bohr, Chattanooga, introduced the speaker.

Mr. Nass first presented a film on core room mechanization and after a few comments, opened the meeting for discussion.—*Fred Hetzler, Eureka Foundry Co.*

Rochester

NONFERROUS foundry practice was considered by members of Rochester Chapter of the AFS at its Mar. 2 meeting held at Hotel Seneca, Rochester, N. Y. Robert A. Colton, Federated Metals Division, American Smelting & Refining Co., Barber, N. J., was the speaker and his topic was "Brass and Bronze Foundry Practice."

Mr. Colton discussed the proper venting of cores and molds. He pointed out that since the mold cavity is filled with air, it becomes a gas removal problem that must be met in order to have the molten metal enter the mold and make a solid casting. He stated that misruns and cold shuts are prevented by proper venting.

Other important factors governing the production of sound brass and

(*Continued on page* 374)

PENNSYLVANIA STATE UNIVERSITY Student Chapter of the AFS members for 1954 are shown above. Front, left to right, are D. C. Ekey, adviser; G. Bortle, secretary; F. Mears, chairman; L. Gruber, vice chairman; and W. P. Winter, adviser. Center, left to right, are John Leaman, John Hahn, Roger Yard, Leroy Yates, William Ehrhart and Donald Clark. Rear, left to right, are Kenneth Pinnow, James Bryan, Carl Beppler, Kenneth Horst, Richard Reich, Harry Nelson and Ronald Darby. Paul Soltis, treasurer, Richard Dennis, co-secretary, and 15 other members were not present

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PHILADELPHIA Chapter of the AFS held separate sessions on steel, brass and bronze and gray iron at its March meeting. Left to right, top, are the technical chairmen: Philip Grimard, Crucible Steel Castings Co., Lansdowne, Pa., steel; William Ball Jr., R. Lavin & Sons, Chicago, brass and bronze; and Cliff Merkert, Olney Foundry Division, Link-Belt Co., Philadelphia, gray iron. Left to right in the bottom view are the speakers, William S. Pellini, Naval Research Laboratory, Washington, steel; Fred L. Riddell, H. Kramer & Co., Chicago, brass and bronze; and John Rendall, Great Lakes Carbon Co., St. Louis, gray iron. Photographs by courtesy of Leo Houser, Dodge Steel Co.

(*Continued from page* 371)

bronze castings in green sand molds which he discussed included gating, risering and pouring.—*H. G. Stellwagen, Hetzler Foundries Inc.*

Pittsburgh

MORE than 120 members of the Pittsburgh Foundrymen's Association met at the Webster Hall Hotel Mar. 15 to hear a talk by S. H. Snee, superintendent of manufacturing processes, Westinghouse Air Brake Co., Pittsburgh. Mr. Snee discussed installation, operation, testing and results of his company's cupola fly ash collectors.

Because foundries in Allegheny county face possible tightening of smoke control laws and changes may also be made in the Pittsburgh law governing smoke control, interest in types of controls is mounting.

Clyde B. Longdon, supervising plant engineer of Westinghouse Air Brake, introduced the speaker following dinner. Mr. Snee outlined the need for collection of cupola fly ash. The company installed two collectors utilizing a curtain of water to trap the ash. In this installation, the collectors on the roof required erection of scaffolding around the stack; this accounted for over half the cost. As the speaker pointed out, this scaffolding might not be necessary in other foundries.

In Westinghouse Air Brake's fly ash collector, water is recirculated through tubes and forms a solid curtain above the stack. As hot gases pass through this curtain, solid particles are washed out and pass down a drain with the water. No cooling is required for this water, which is held in a 6000-gal. capacity tank. Water level in the tank is regulated by an overflow pipe.

Mr. Snee added that evaporation loss of water amounts to about 400 gal. an hour during operation. Need for smoke control is evident by collection of 1000 lb of fly ash during an eight to ten hour operation of one of the company's cupolas. The speaker stated that the Allegheny County Smoke Control Board is now testing the collector's operation at his plant.—*Robert Love*

Philadelphia

THREE top-flight speakers featured the March meeting of Philadelphia Chapter of the AFS. There were 140 members and guests present at the Engineers Club, Philadelphia, to participate in the three roundtable discussions.

Bonnie Miller, Crown Smelting Co., Chester, Pa., served as technical chairman, and after a general discussion, the group divided into three sections.

William Pellini of the Naval Research Laboratory, Washington, addressed the steel foundrymen on the subject, "Brittle Fracture Behavior in Steels." He used slides to illustrate his talk. In addition, he discussed impact testing and the reaction of different types of steels at various temperatures.

Fracture tests as a control measure for both gray iron and nonferrous castings were covered. Speaker for the gray iron group was John Rendall, Great Lakes Carbon Corp., St. Louis; while Fred Riddell, H. Kramer & Co., Chicago, discussed the subject for the brass and bronze foundrymen. — *Charles R. Sweeny, Atlantic Steel Castings Co.*

Central New York

PRINCIPAL speaker at the Feb. 12 meeting of Central New York Chapter of the AFS was Warner Bishop, manager, Foundry Products Division of Archer-Daniels-Midland Co., Cleveland. There were 90 members and guests present at the Onondaga Hotel, Syracuse, to learn details of the "D Process for Shell Molding."

In describing the process, Mr. Bishop stated that a fine dry sand with an oleo-resinous binder is blown through a pattern mounted on the head of a core blowing machine into a contoured dryer. The resultant shell is baked for approximately one-half hour at temperatures from 425 to 500° F in conventional core baking ovens.

The joined shells can be poured

(*Continued on page* 376)

INCREASE Cupola Efficiency

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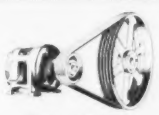
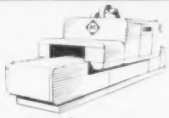


Motors-Drives Control



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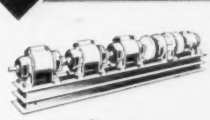

Regulex Arc Furnace Control

WESTERN NEW YORK Chapter of the AFS met Mar. 5 at Hotel Sheraton, Buffalo. Illustration shows Joseph M. Clifford, Atlas Steel Casting Co., chapter president, left, as he presents a bronze plaque to Grant S. Diamond, president, Electro Refractories & Abrasive Corp., in recognition of his work as general chairman of the First Niagara Frontier Regional Conference, Buffalo, Sept. 17-18, 1953. Photograph by A. J. Heysel, E. J. Woodison Co.

(*Continued from page* 374)

vertically or horizontally, producing castings of close tolerance and smooth finish. The method permits close control of shell thickness, and thereby permits pouring relatively heavy castings without back-up material through adjustment of shell thickness.

Claimed advantages of the process include less expensive pattern equipment with speed limited only by the capacity of the blowing machine. The process also requires a less expensive binder. Its one economic disadvantage is the investment in a sufficient number of driers to accommodate the baking cycle.

Variations of the process are stack molding of flat back slab shells in which no dryer is required; also using the mixture as facing on regular core sand dry molds.

The meeting concluded with a discussion period and a social hour.

The application of mechanization to molding was considered at the Mar. 12 meeting of Central New York Chapter of the AFS. Ninety-five members met at the Onondaga Hotel, Syracuse, N. Y., to hear C. V. Nass, vice president and general manager of Beardsley & Piper Division, Pettibone-Mulliken Corp., Chicago. Mr. Nass discussed the subject as it applies to both large and small foundries. He also showed an interesting and instructive film which indicated the progressive steps in mechanization that can be employed in both types of shops.

Mr. Nass stated that the extent to which mechanization is employed should be governed by the individual condition of the organization, and he urged thorough study by competent counsel to insure maximum operating advantages and economies.

The usual discussion period and social hour followed.—*Bruce R. Artz, Pangborn Corp.*

Western New York

SPEAKER at the March meeting of Western New York Chapter of the AFS was Clyde A. Sanders, vice president, American Colloid Co., Chicago. Mr. Sanders probably is green sand molding's most vociferous booster and stoutest defender.

He maintains that it is unfair to compare the quality of castings made by one of the newer methods, in which moisture and other properties of the sand are carefully controlled and the sand itself is carefully blended, mulled and handled, with the castings made in some green sand

(*Continued on page* 378)

CHICAGO Chapter of the AFS held its ladies night Feb. 27 at the Palmer House and then met for its regular monthly meeting on Mar. 1, at the Chicago Bar Association. Shown above are a few of the foundrymen and their ladies who attended the ladies night affair. Below, left to right, at the Mar. 1 meeting are William McFatridge, International Harvester Co., technical chairman; Robert Schauss, Werner G. Smith Co.; Walter R. Jaeschke, Whiting Corp.; Robert Doelman, Miller & Co., chapter vice president; Tom Barlow, Eastern Clay Products Division, International Minerals & Chemical Co., speaker; John A. Rassenfoss, American Steel Foundries, chapter president; and Frank Brewster, Harry W. Dietert Co., Detroit, speaker. Photos are by courtesy of Fred Ridenour, Whiting Corp.

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TWIN CITY Chapter of the AFS met Mar. 9 to hear Howard Wilder, manager, Iron Foundry Division, Vanadium Corp. of America, Detroit, discuss "Modern Cupola Operation." Shown at left, from left to right, are Mr. Wilder and A. W. Johnson, Northern Malleable Iron Co., vice chairman of the Twin City Chapter. Photograph is by R. J. Mulligan, Archer-Daniels-Midland Co.

(*Continued from page* 376)

foundries where the sand pile is composed of equal parts of shakeout sand and floor sweepings to which has been added an indeterminate amount of clay and water without benefit of mulling.

Mr. Sanders believes the newer developments are here to stay, and have definite places in the foundry industry. On the other hand, he urged foundrymen to pay more attention to green sand. His presentation also included an interesting series of slides illustrating a number of common defects and also some unusual specimens.—*William H. Oliver, American Radiator & Standard Sanitary Corp.*

Eastern New York

COST control systems and incentive plans as applied to small foundries were discussed by J. A. Westover, Westover Engineers, Milwaukee, at the March meeting of Eastern New York Chapter of the AFS.

To illustrate his talk, Mr. Westover presented a number of slides outlining cost control methods and showing forms he recommends for accumulating cost data. Three points emphasized in his discussion were: Cost control is based on the conception of pricing a job rather than metal poundage; any adequate cost system must be based on shop time; and no system will work without a completely informed supervisory staff.

He described flexible incentive plans and stated sliding scales are in use in some plants. One example in which he stated men had accepted a reduction in piece work price on a voluntary basis caused some eyebrow lifting, but Mr. Westover pointed out that acceptance was accomplished by good supervisory effort.

During February, the Eastern New York Chapter had as its technical speaker Joseph A. Gitzen, president of Delta Oil Products Co., Milwaukee. Mr. Gitzen first covered the subject of core production and then discussed recently introduced production methods, including high-pressure molding and the D process.

Mr. Gitzen observed that many of the supposedly new techniques being employed by the foundry industry today were established long ago and perhaps their growth and adoption today reflect a willingness on the part of foundrymen to accept new ideas.—*S. A. Eliot, General Electric Co.*

EASTERN NEW YORK Chapter of the AFS heard a discussion of core baking and new molding techniques at its February meeting. Speaker was Joseph A. Gitzen, president, Delta Oil Products Co., Milwaukee, who is shown in the top view. In March, J. A. Westover, Westover Engineers, Milwaukee, talked about cost control systems and incentive plans in small foundries. Mr. Westover is on the right, below. William C. Stevenson, Rensselaer Valve Co., chapter vice chairman, is on the left. Photos by Howard Bodwell, General Electric Co.

Twin City

REGULAR meeting of Twin City Chapter of the AFS was held Mar. 9 at which H. H. Wilder, manager, Iron Foundry Division, Vanadium Corp. of America, Detroit, was the featured speaker.

Mr. Wilder's talk, "Modern Cupola Operation," centered on the misuse of melting furnaces. He pointed to the large dollar savings that are possible through a thorough study of all the factors in producing metal.

Toward this end, foundrymen should know what makes the cupola operate and how various factors change the metal quality. All factors must be controlled carefully. The speaker suggested a rigid time schedule in starting and finishing the melt so that variations in procedure will be apparent.

Secondly, the foundryman must know the chemical and physical nature of ingoing materials, then control these materials to established specifications. He must know if his equipment is capable of doing the job required. In this interest, the design must be carefully studied. When all of these factors are understood, definite steps should be taken to see that there are no deviations from the established practice. In conclusion, Mr. Wilder recommended that one person be placed in control of the

(*Continued on page* 380)

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SOUTHERN CALIFORNIA Chapter of the AFS met Mar. 12 at Rodger Young Auditorium, Los Angeles, to hear Ray Sutter, Sutter Products Co., Detroit, talk on automatic shell molding equipment. Left to right, top view, are Charles R. Gregg, Gregg Iron Foundry; Mr. Sutter; Hubert Chappie, National Supply Co., chairman of Southern California chapter; and C. J. Cluff, Frederic B. Stevens Co. From left to right below are Orville Wilson, William C. Baud and Ed Worth, all of Mechanical Foundries Division of Food Machinery & Chemical Corp. Photos are by courtesy of K. F. Sheckler, Calmo Engineering Co.

(*Continued from page* 378)

melting department and made responsible for its proper functioning.

During the meeting it was announced that the chapter had surpassed the membership goal set for 1953.

The University of Minnesota, whose foundry course is under the supervision of Fulton Holtby, a member of the Twin City Chapter, through the Foundry Educational Foundation recently received a $500 scholarship fund provided by American Steel Foundries.—*R. J. Mulligan, Archer-Daniels-Midland Co.*

Central Michigan

THE subject, "Are Your Foundry Costs Reliable," was discussed by R. T. Lewis, secretary and sales manager, Keen Foundry Co., Griffith, Ind., at the Mar. 17 meeting of Central Michigan Chapter of the AFS. The meeting was held in Battle Creek, Mich., at the Hart Hotel.

The speaker emphasized that up to this point consumers have been more concerned with a good source of supply than with costs, but this period is rapidly coming to an end. He then analyzed cost procedure for various departments of a foundry. George Petredean, Calhoun Foundry Co., Homer, Mich., was technical chairman.

Ashley Sinnett, newly appointed educational director of AFS, also spoke briefly, describing his post with the national society. His aim is the introduction of foundry courses to the industrial arts curriculum in secondary and vocational high schools; to develop an in-plant training program which will enable workers to better themselves; and to develop an "assistant to the apprenticeship" program.

A. C. Hensel, Albion Malleable Iron Co., Albion, Mich., and chairman of the chapter's Educational Committee, reported 58 had registered for the eight-week quality control school, just concluded.—*Bob Dodge, Archer-Daniels-Midland Co.*

Southern California

SHELL molding was the topic of discussion at the Mar. 12 meeting of Southern California Chapter of the AFS. Speaker was Ray Sutter, Sutter Products Co., Dearborn, Mich., and his talk was entitled "Automatic Shell Molding Machines and Auxiliary Equipment."

He also presented slides and movies which showed how far shell molding has progressed, not only in the United States but also in England. Unfortunately, the films did not show how the mold halves are clamped or poured-off, which would have been of interest to many foundrymen.

James Oliva, the chapter's entertainment chairman, reminded those present of the annual Ladies Night dinner dance to be held May 1 at the Pacific Coast Club, Long Beach, Calif.—*Otto H. Rosentreter, National Engineering Co.*

Texas

TEXAS Chapter of AFS met at the Western Hills Hotel, Fort Worth, on Mar. 12 with approximately 75 members on hand to hear John Kane,

(*Concluded on page* 382)

TEXAS Chapter of the AFS met Mar. 12 at the Western Hills Hotel, Fort Worth, Tex. Left to right are John A. Ray, Dallas representative, American Air Filter Co.; John Kane, manager, Dust Control Division, American Air Filter Co., Louisville, speaker; Israel Smith, Western Foundry Co., Tyler, Tex., chapter chairman; Charles T. Ragland, Texas Steel Co., Fort Worth; Herman Pfeiffer, Electro Metallurgical Co., Houston; G. E. Seavoy, Whiting Corp., Harvey, Ill.; C. W. Williamson, Trinity Valley Iron & Steel Co., Fort Worth; and R. W. Paulsen, R. W. Paulsen Co., Davenport, Iowa

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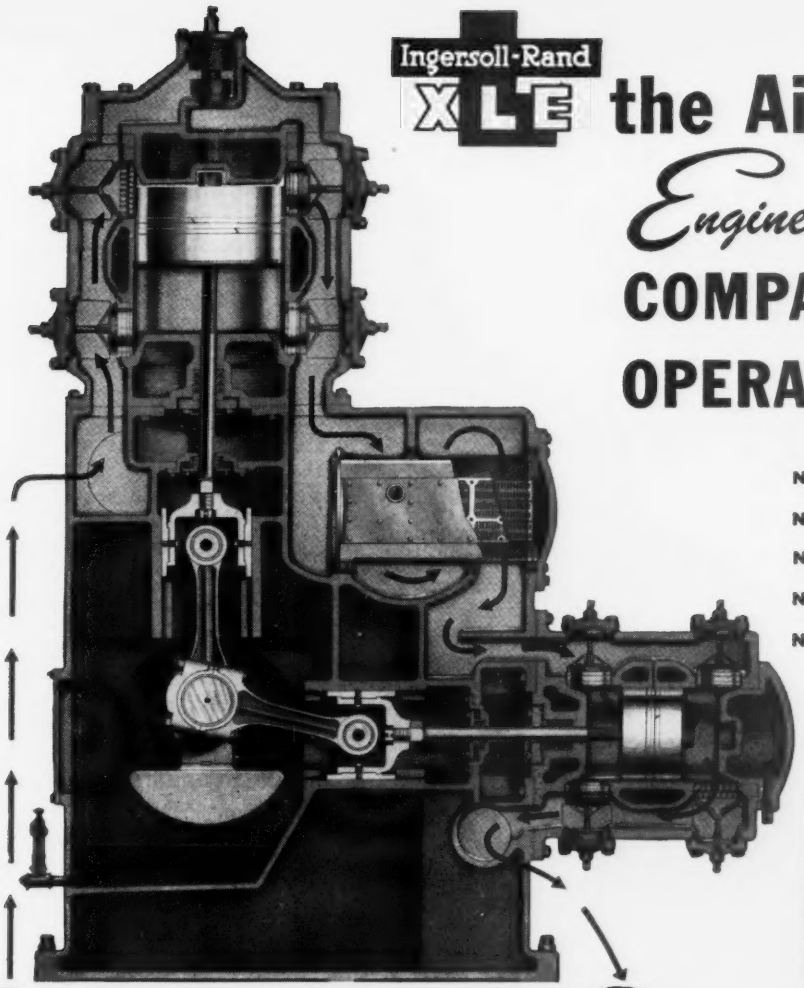

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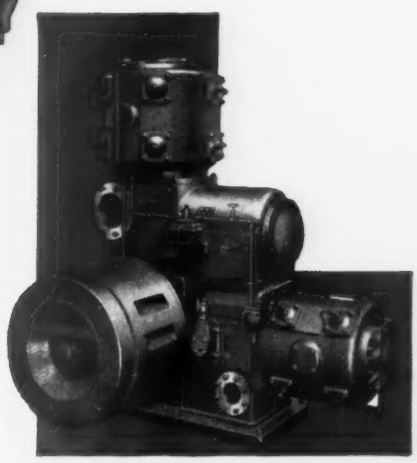

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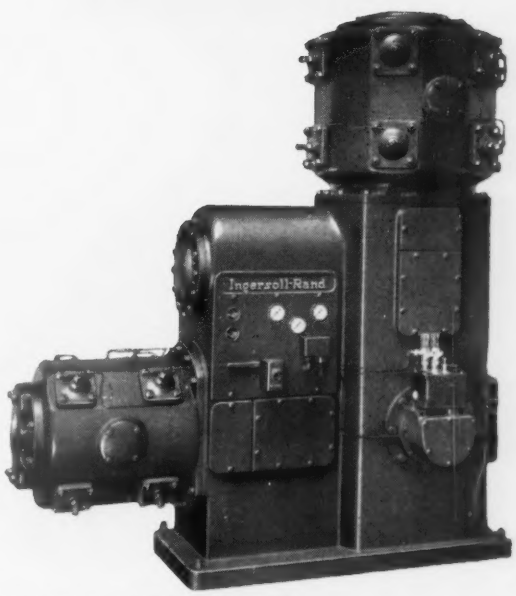

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VISIT OUR BOOTH 1412 AT THE FOUNDRY SHOW

DETROIT Chapter of the AFS met Mar. 18 at the Detroit Leland Hotel to hear a talk by Robert W. Gardner, Dearborn Iron Foundry, Ford Motor Co., and to award prizes to the winning contestants in the local pattern contest. Left illustration, Harry E. Gravlin, left, Ford Motor Co., chapter chairman, turns the meeting over to Paul Copeland, Ford Motor Co., for presentation of awards to the pattern contest winners. Right, Mr. Gardner, speaker for the evening, addresses the chapter. Photographs courtesy of the Claude B. Schneible Co.

(*Concluded from page* 380)
manager of Dust Control Division, American Air Filter Co., Louisville. His topic was "Foundries Can Be Clean, Safe and Good Neighbors." John A. Ray, Dallas representative of American Air Filter, assisted Mr. Kane in his presentation.

With slides to illustrate, Mr. Kane described methods of collecting dust in various foundry operations. He gave formulas by which foundrymen can calculate the amount of dust created in these operations and then discussed the most economical methods for control.—*William A. Bearden, M. A. Bell Co.*

Cleveland Non-Ferrous

MEMBERS of Cleveland Chapter of the Non-Ferrous Founders' Society met Mar. 18 at the Belmont Hotel, with James W. Wolfe, executive secretary of the society, as special guest.

In addition, two representatives of the Continental Insurance Co. were present to explain the benefits and cost of the insurance and hospitalization program being established for members of NFFS. Mr. Wolfe also spoke on business conditions.

The meeting was concluded with presentation of the color film, "Effect of Gating Design on Casting Quality."—*Walter O. Larson Jr., Grafton Foundry Co.*

Boston Non-Ferrous

MEMBERS of Boston Chapter of the Non-Ferrous Founders' Society met Feb. 18 at the Engineers Club, Boston, to hear Ray Olson, Shell Process Inc., Chicopee, Mass., speak on "Shell Molding Equipment."

Mr. Olson illustrated his talk with colored slides. Points covered in his talk included: The trend to horizontal pouring thereby eliminating back-up; use of combination cope and drag patterns which by snapping and assembling the shells while still hot can increase the speed of the production setup.—*John V. McCarthy, North American Smelting Co.*

Wisconsin

FOLLOWING the successful regional conference in February, members of Wisconsin Chapter of the AFS met Mar. 12 at the Schroeder Hotel, Milwaukee, to hear a talk entitled "Casting Buying vs. Buying Castings." It was presented by Oscar P. Ketter, buyer for Oilgear Co., Milwaukee.

Mr. Ketter explained the relationship between the casting buyer and the casting seller, and in his work, Mr. Ketter has gone more deeply into foundry problems and foundry operations than most buyers find necessary.

Chapter President A. F. Pfeiffer, Allis-Chalmers Mfg. Co., announced the following nominations for officers and directors to serve during 1954-55: President, Robert V. Osborne, Lakeside Malleable Castings Co., Racine, Wis.; vice president, P. C. Fuerst, Falk Corp., Milwaukee; secretary, L. R. Hutchinson, Nash-Kelvinator Corp., Kenosha, Wis.; and treasurer, Bradley H. Booth, Carpenter Bros., Milwaukee. Directors nominated for a 3-year term are: George I. Gilson, J. E. Gilson Co., and Clarence A. Gehrman, Sterling Wheelbarrow Co.

The chapter's annual Old Timers and Apprentices Night is to be held May 21 at Hotel Schroeder, Milwaukee. President Pfeiffer said the chapter wishes no old timer to be overlooked and he urged if any member knows an old timer in foundry work —one who has been with the industry for 50 years or more—to send his name to chapter headquarters so that a plaque can be prepared for presentation at the meeting. Apprentices in foundry work also are to be present at the meeting with prizes to be awarded the winners of the apprentice contest.—*John E. Hubel*

San Antonio

TWO interesting films were featured at the Mar. 22 meeting of the San Antonio section of Texas Chapter of the AFS. Approximately 70 members and guests were present at the meeting, held at the Alamo Iron Works.

The first film, "Outstanding Opportunities in the Foundry Industry," was shown through the courtesy of Central Foundry Division, General Motors Corp., Saginaw, Mich. This film was used by James H. Smith, general manager of Central Foundry Division, to illustrate his Charles Edgar Hoyt lecture during the 1953 AFS convention.

The second film, "Steel Casting Design," is a recent production of the Steel Founders' Society of America.

A social hour closed the meeting. Refreshments were provided by Kincaid-Osburn Electric Steel Co., San Antonio.

During February, members of the San Antonio section met at the San Antonio Machine & Supply Co. to view two films on Mexico. The films were provided by William Harrison Furlong Travel Tours, San Antonio. The Alamo Iron Works served as host at the meeting and provided refreshments.—*Edw. W. Pruske, Alamo Iron Works.*

Metropolitan

INFORMAL roundtable discussions on the general subject of "Efficient Foundry Practices" attracted a large number of foundrymen to the Mar. 1 meeting of Metropolitan Chapter of the AFS held at the Essex House, Newark, N. J.

Harlie M. Freeman, foundry superintendent, Taylor-Wharton Iron & Steel Co., High Bridge, N. J., was discussion leader for the steel group; A. J. Derrick general manager, Ferdinand J. Snow Machinery Co., Westwood, N. J., acted as discussion leader at the gray iron session; Robert A. Colton, Federated Metals Division, American Smelting & Refining Co., Barber, N. J., led the nonferrous foundry practice discussion. Technical chairman of the meeting was W. T. Bourke, metallurgist, American Brake Shoe Co., Mahwah, N. J.—*W. T. Bourke, American Brake Shoe Co.*

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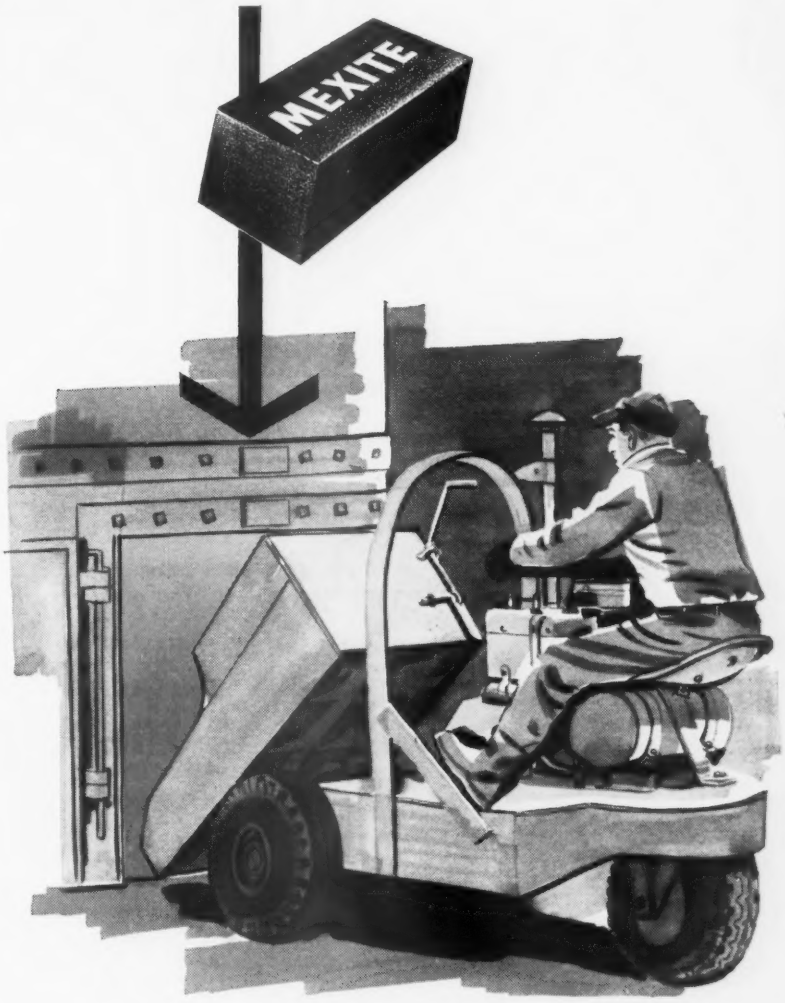

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THE UNITED STATES GRAPHITE COMPANY

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Swing-frame grinding large steel casting with a 24 x 3 x 12, organic-bonded aluminum oxide grinding wheel. The grinder is removing torch marks and fins.

Grinding Operations in the Cleaning Room

By GLENN S. EISAMAN
Sales Engineering Dept., Bonded Products and Grain Div.
The Carborundum Co., Niagara Falls, N. Y.

FOUNDRY cleaning room grinding operations involve in general only those machines and abrasive wheels used in rough grinding or so-called snagging operations.

In precision grinding operations, the conditions surrounding the operation are fixed. The work pieces are well standardized, particularly in mass produced items, or are limited in size and weight by adequate predetermined machine size and capacity. Stock removal is almost a constant from piece to piece, as is the distribution of stock on the work piece. Machine and work movements are mechanically controlled, with the result that work production, power consumption work-wheel contact time, operator fatigue, and practically all other cost factors become predictable elements in the calculation of unit grinding costs.

In contrast, with snagging operations—particularly in the average foundry—work pieces are in almost infinite variety with regard to shape, size, weight and particularly stock removal. Stock removal even on identical pieces varies, and distribution of the material to be removed is nonuniform and affects the stock removal rate of the grinding wheel to the extent that the time cycle cannot be predicted for equal over-all metal removal.

Machine and work movements are manually controlled. Operator ability and judgment, rather than mechanized movements, determine work production, power consumption, work-wheel contact time and wheel cost. There are, in addition, two less tangible factors—machine maintenance and operator fatigue. Practically all cost factors become relatively unpredictable. The over-all time cycle of any one operation is influenced further by the nonuniformity of distribution of the stock to be removed and adds to the difficulty in calculating and comparing unit grinding costs.

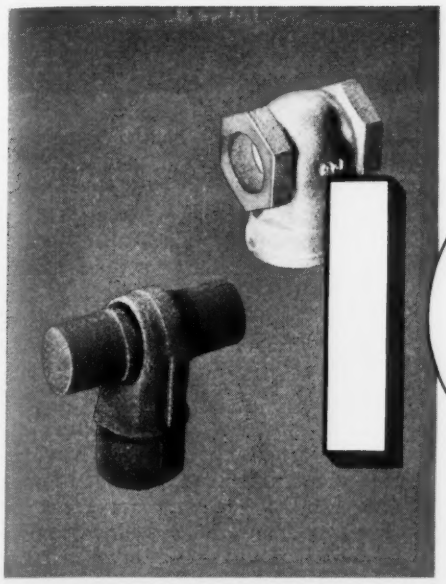
Much can and has been done to reduce foundry cleaning room costs. Much more can be accomplished through a thorough understanding of the factors effecting these costs.

Let us then proceed to re-state these factors and correlate as many as time will permit.

Machine Equipment—Rough grinding operations in the foundry are performed on three basic classes of machines: 1. Swing frame grinders. 2. Floor stand grinders. 3. Portable grinders (air or electric).

All of these three basic types of equipment are designed to operate in two distinct speed ranges. The speed determines the type of abrasive wheels that can be used. The so-called low-speed machines utilize vitrified abrasive wheels which can be

(*Continued on page* 386)



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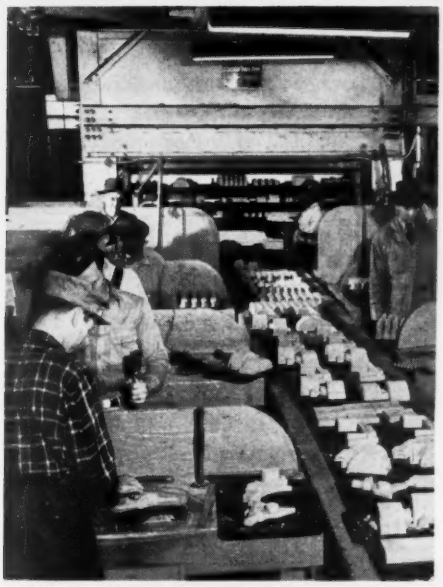

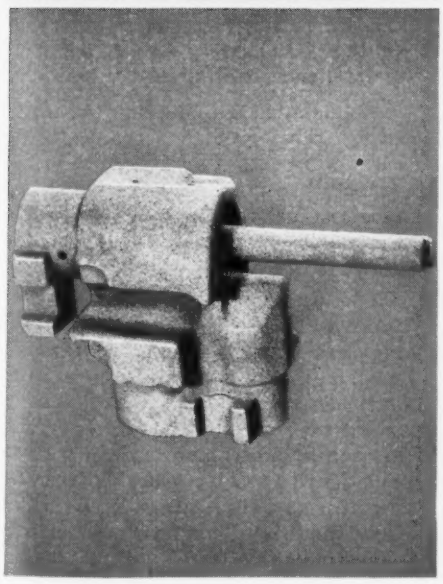

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CHEMICAL DIVISION

Urea and Phenolic Resin Core Binders . Shell-Mold Resins . Core Spray . Core Paste . Parting Agents

(*Continued from page* 384)

operated at speeds not to exceed 6500 sfpm; the high-speed machines utilize resinoid or rubber bonded abrasive wheels which can be operated at a maximum of 9500 sfpm.

The factors influencing choice of machines, speeds and abrasive products will be discussed more fully under each machine classification. Higher stock removals per contact hour can be obtained, under proper conditions, with the high speed wheels of the resinoid and rubber types of abrasive wheels.

Swing Frame Grinder—These machines are manufactured in a variety of sizes carrying wheels in diameters from 12 to 24 in.

The old type of swing frame grinders were of L type construction driven from an overhead shaft and were suspended at the top of the L. The vertical and horizontal members were hinged at the points of suspension and intersection of the members to allow vertical and horizontal movement of the wheel, with the wheel spindle located on the open end of the horizontal member.

The wheel spindle was driven by two belts, one vertical from the main shaft to and through a countershaft at the intersection from this countershaft through a horizontal belt to the wheel spindle. This type of machine is practically obsolete and has been replaced by individually powered units consisting of a horizontal frame suspended by a centrally located cable or chain, with a motor at one end and wheel spindle at the opposite end; power is transmitted through a multiple V belt drive direct from the motor shaft to the wheel spindle.

This new type of construction allows a greater range of machine movement, as the upper point of support may be of the movable type traveling on a rail or hung from a combination rail and jib crane. For quick wheel height adjustment, a chain hoist may be introduced as the central suspension member.

The new type of machine has the following advantages:

1. Adapted to higher spindle speeds.
2. Covers greater working area.
3. Easier for operator to handle; can be balanced more readily.
4. There is less down time. Being individually powered, only a single machine need be shut down for wheel changes, repairs or delays due to crane service.
5. Wheels can be mounted on the wheel spindles between bearings for high speed (9500 sfpm) operations.
6. There is more positive drive through the multiple V belt.
7. It allows more angular swing to the wheel head.
8. Speed changes are provided to compensate for wheel wear.
9. There are also many other advantages in safety, guarding, belt maintenance, etc.

Application and Field of Use—The swing frame grinder is used in those cases where the work being ground cannot be presented to the wheel face manually. Through and within the mobile limits of the machine, the wheel is taken to the work.

The usual procedure is to deliver the work to be ground to the working area of the machine and through machine manipulation to grind the various areas as required. Heavy work may require additional crane service to present new areas. This is mentioned because lack of crane service may be a large factor in delays, materially and adversely affecting grinding costs.

Machine Size—The larger and heavier the machine, the greater the operator fatigue. The large machines carrying 24 x 3 in. wheels are satisfactory on heavy castings, particu-

(*Continued on page* 388)

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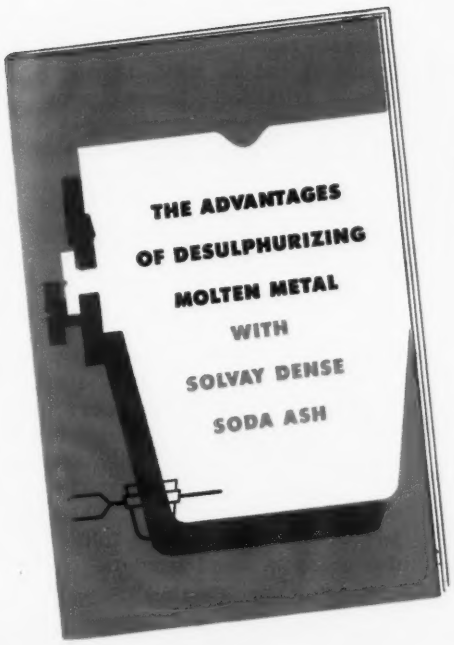

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Ortho-dichlorobenzene · Ammonium Chloride

(*Continued from page* 386)

larly steel castings where large volumes of metal are located in localized areas and the essential machine movements are relatively limited.

More power and wider wheel-work grinding contact can be provided, giving higher stock removal rates per contact hour.

Where metal is distributed over large areas and relatively little stock is to be removed, rapidity of machine movement is essential to rapid stock removal, and lighter machines are indicated to lessen operator fatigue. The medium-weight machines, carrying wheels 18 to 20 in. diameter and 2½ to 3 in. wide, allow easier manipulation of the machine, where the cleaning of broad surfaces is the major problem and the localized areas of burned-off gates and risers are less in volume than in the case of the heavier castings.

Horsepower — Adequate power should be available with adequate transmission from the motor to the wheel spindle, as inadequate power results in high electric motor maintenance, lowered stock removal rates, higher abrasive costs, and higher drive (V-belt) costs.

Relative to the subject of power, it should be stated that machines of the swing-frame type are generally designed and sold for operation with the machine in balance and to carry relatively light loads on the wheel head. Added weight on the wheel head creates higher working pressures at wheelwork interface or contact.

It is not uncommon to see weights, usually in the form of scrap castings, loaded on the wheel head to such an extent that power and transmission become inadequate to drive the wheel without incurring heavy overloads. This is done to promote higher stock removal. If higher stock removal rates are desired, softer wheels should be used, thereby lessening frictional losses, avoiding higher machine maintenance and overloads, and unnecessary operator fatigue.

Dressing Wheel Face—The problem of wheel dressing is not usually a factor of economic consequence on swing frame grinders, due to the fact that the intelligent operator finds sufficient sharp corners or fins on which to dress or resharpen the wheel face. If the wheels tend to glaze in grinding large, heavy work areas, the immediate operation can be interrupted momentarily and the fins of the casting can be used to resharpen the wheel face. This subject will be covered more fully in the discussion on stand grinders.

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should be provided for control of the work during the swing frame grinding cycle because vibration of all frequencies and rolling or rocking movements of the casting during grinding are costly from the standpoint of stock removal rates, abrasive costs, and operator fatigue.

This vibration, in either the machine or work, prevents the operator from maintaining the constant and uniform pressures so essential to the desired maximum uniform stock removal rates. The higher frequencies set up a constant pounding of wheel on work, resulting in higher abrasive consumption and costs. Such operation may result in a reduction in the stock removal rate—as high as 50 per cent.

Where vibration is well dampened, a steady, even, heavy spark flow is obtained, in contrast to the intermittent, heavy and light spark flow where extreme vibration is present.

Instability of the work support not only lowers the stock removal rate, but complicates the manipulation of the grinder by keeping the operator off balance. In extreme cases, the operation becomes hazardous and at all times is fatiguing and unsatisfactory.

Wheel Speeds—As pointed out previously, swing frame grinders are designed to operate in two distinct speed ranges, and the optimum safe operating wheel speeds must be maintained to attain maximum stock removal and resultant lower abrasive costs.

Each machine is designed for the operation of a wheel of specific maximum diameter with spindle speeds designed to operate at a maximum of either 6500 or 9500 sfpm (surface feet per minute).

The "low-speed" (6500 sfpm) machines are designed to use vitrified or ceramic bonded abrasive wheels. The "high-speed" (9500 sfpm) machines utilize the stronger grades of organic bonded wheels. These wheels may be bonded with synthetic resins described as resinoid wheels or bonded with rubber and identified as such.

Resin and rubber bonded wheels may, and are, sometimes used on the low-speed machines operating at speeds of 6500 sfpm. Vitrified wheels, however, must not be used on "high-speed" (9500 sfpm) machines. This subject is thoroughly treated in the "American Standard Safety Code for the Use, Care and Protection of Abrasive Wheels."

It is obvious that the surface or periphery speed of the grinding wheels is reduced as the diameter of the wheel becomes smaller through wear, if the speed of the wheel spindle, rpm, is maintained constant.

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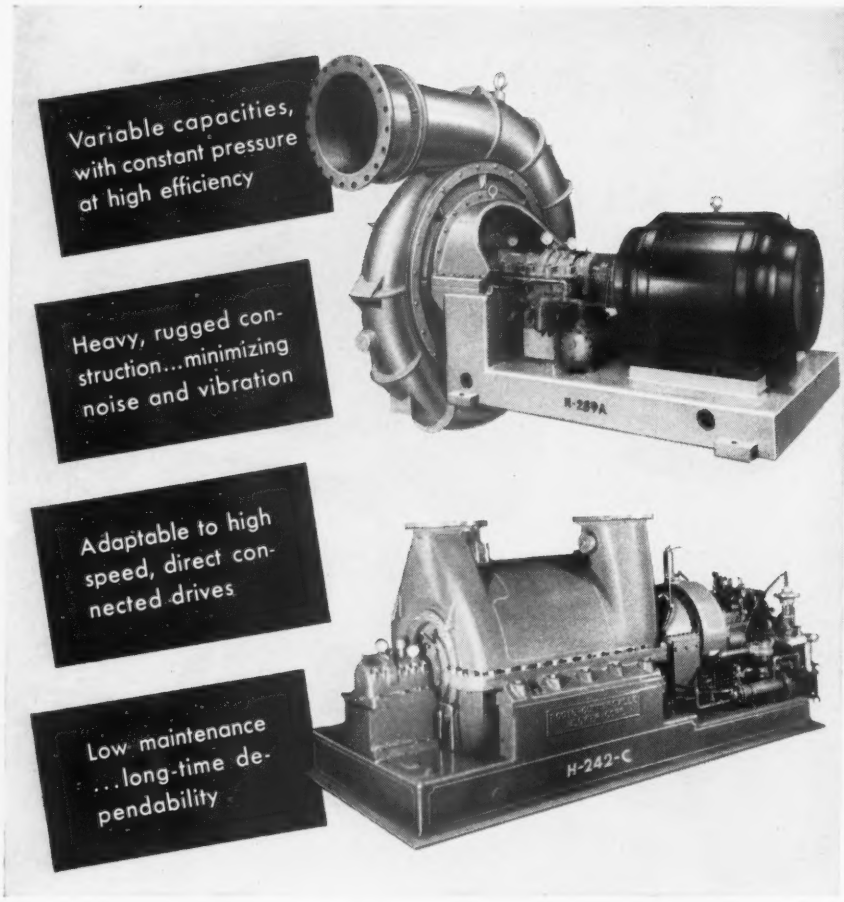
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By way of illustration, let us assume that a 24-in. wheel is mounted on a wheel spindle, operating in the "high speed" range of 1512 rpm, resulting in a wheel periphery speed of 9500 sfpm.

The table below illustrates the loss of surface speed due to wheel diameter reduction at the constant speed of 1512 rpm.

24-in. diam at 1512 rpm = 9500 sfpm
22-in. diam at 1512 rpm = 8708 sfpm
20-in. diam at 1512 rpm = 7917 sfpm
18-in. diam at 1512 rpm = 7125 sfpm
16-in. diam at 1512 rpm = 6333 sfpm

From the table it can be noted that the wheel speed has been reduced to 7917 sfpm at 20 in. Since most machines are equipped with at least one speed change—effected by changing belts to alternate pulleys—these can be used to bring the spindle speed up to 1814 rpm at 20 in. restoring the original sfpm of 9500.

Since loss of speed causes any given grade of wheel to act softer and results in increased abrasive loss, it is necessary to maintain speeds at the nearest optimum safe speed to obtain the greatest efficiency. For this reason, it is imperative that the speed changes built into your equipment be utilized.

The same result can be obtained by remounting the 24-in. wheel on a 20-in. machine when the diameter has been reduced to 20 in.; the 20-in. machine will provide for the higher necessary rpm for the maintenance of the desired sfpm.

Reasonable abrasive efficiency can be expected with proper wheel grade placement if the resinoid or rubber bonded wheel speeds are maintained between 8000 and 9500 sfpm, and the vitrified wheels in a speed range of 5000 to 6500 sfpm.

(To be concluded next month)

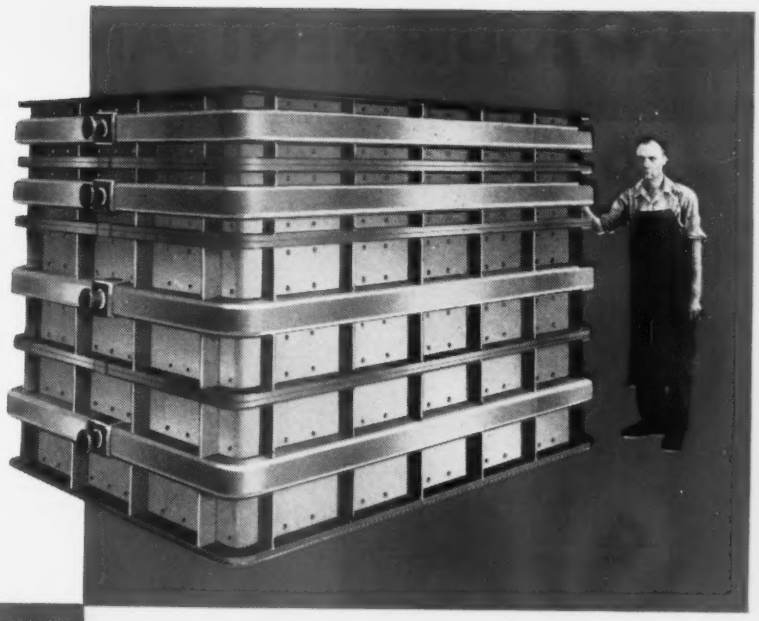
Institute Names Leading Industrial Companies

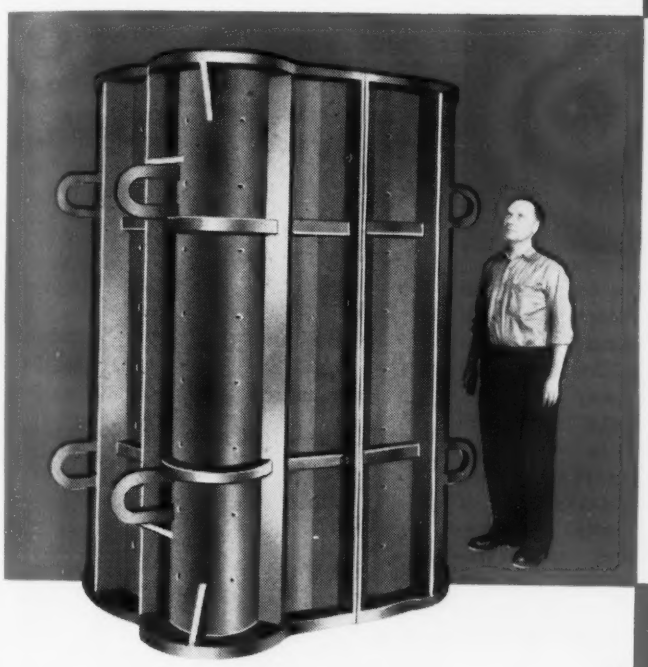
The top 348 industrial organizations in the United States and Canada, according to the American Institute of Management, are named in the institute's "Manual of Excellent Managements," recently released. The manual is the result of a year's study and listings are based upon the institute's comparative audit methods.

Purpose of the manual, according to the publishers, is to enable those concerned with management appraisal and improvement to compare the records of various companies, industries and areas, so that a more accurate judgment of a concern's management performance can be made.

Copies can be purchased from American Institute of Management, 125 East 38th St., New York 16.

These Three SHANAFELT FLASKS tell a story of importance to any user of heavy duty flask equipment





▲ Four section flask with total weight of 10,152 lbs. Sidewalls and bars 1/2" thick. Flanges 1" x 5" with channel reinforcement.

◀ Unusual shape and construction—for casting ingot molds. 1/2" sidewalls, 2" x 5" flanges. Weight 6,414 lbs.

Six section flask with bottom plate, loaded for shipment. Flask made with 1/2" material. 1" x 3" flanges and a 3/8" channel specially formed to give strength to the shallow 6" sections. Total weight 16,620 lbs. ▼

The modern SHANAFELT plant is equipped for making steel flasks in any style, size, and shape.

Just tell us about the flask you need and SHANAFELT engineers and sales representatives will work out the construction details and give you estimates of cost, weight and delivery.

The SHANAFELT Manufacturing Co.

ESTABLISHED 1893

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NEW EQUIPMENT AND SUPPLIES

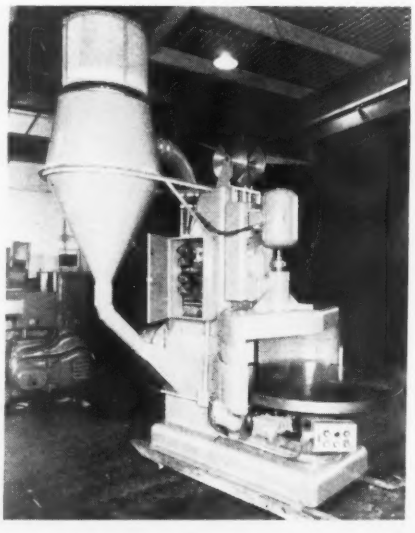
Tractor Shovel: Jaeger Machine Co., 920 Dublin Ave., Columbus 16, O.—Hydraulically-actuated 12 cu ft tractor shovel is designed to speed bulk handling in foundry, yard or box car. Performance features include a lifting capacity of 1200 lb, speeds of 13.88 mph in reverse and 7.66 mph in forward, turning radius of 6.6 ft, dumping clearance of 4½ ft (6 ft 8 in. under bucket hinge) and a reach of 2 ft 7 in. Constant mesh transmission, with separate directional shift lever, permits instant changes of speed and travel in either direction. Bucket extends beyond width of tires to permit working flush against walls or into corners for clean pickup. Boom arms are designed to crowd bucket forward as it rises. Two double-acting bucket control pistons tilt the bucket back to level position, to retain its full load without spilling. Steering is through the rear wheels, and all load is centered on the large front driving wheels.

For More Details Circle No. 1—Page 397

Sand Flask Coating: Industrial Metal Protectives Inc., 401 Homestead Ave., Dayton 8, O.—Zinc-base coating, highly resistant to corrosion and abrasion, is reported to lengthen the service life of sand flasks. The hardness of polymerized silica surrounding each particle of zinc and the penetration of these particles into the base metal surface contribute to the longer life of products coated with the material, it is claimed. The formula is available to all foundries and may be applied by spray or brush. Grit blasting is necessary in the surface preparation, as is vapor degreasing. An air-dry period of 10 minutes is followed by a baking cycle of one hour at 350° F metal temperature. This baking time can be reduced, using 45 min at 450°, 30 min at 550° or 20 min at 650°.

For More Details Circle No. 2—Page 397

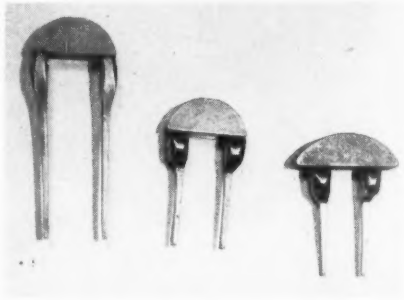
Core Grinder: Standard Pattern Works, Machine Division, 6771 East McNichols Rd., Detroit 12—Core grinder features a telescoping shroud



which encloses the grinding wheel and a large portion of the table and provides protection from flying sand by deflecting it into a container in the special base. A funnel-like opening through the machine pulls the free-flying sand and dust into a separate dust collector, which can be supplied as a built-in accessory or as an adjacent unit connected from a rear opening to any existing dust-arresting system. The 18-in. grinding wheel can be set at any fixed position, or operated with a sliding head which has a range of 9 in. The rotary table is mounted on precision sealed bearings and can be rotated either manually or controlled with an adjustable cone drive gear speed reducer motor driven to turn at 5 rpm, but can be set at any given speed through change of pinion gear. Cores can be safely loaded and unloaded while the table is in motion. Two table sizes, 48 and 70 in., are available.

For More Details Circle No. 3—Page 397

Radius Spider Chill: Standard Horse Nail Corp., New Brighton, Pa.—Company has added a radius spider

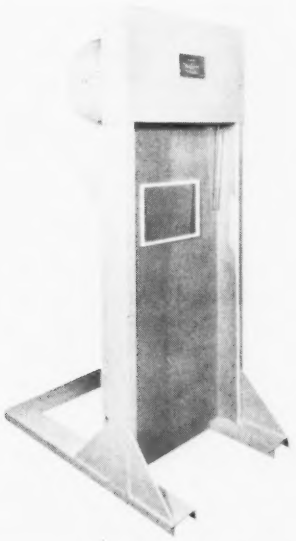


chill to its extensive line of chill nails and spiders. This radius chill is claimed by the manufacturer to combine revolutionary features not previously obtainable and reportedly is designed to meet a variety of applications in the casting industry.

For More Details Circle No. 4—Page 397

Fluoroscope: Radioactive Products Inc., 443 West Congress St., Detroit 26—Gamma ray fluoroscope that uses radioactive materials to provide a ray more penetrating than x-ray is said to have industrial inspection applications. The instrument stands 7 ft high and contains its radioactive source in a steel-cased cylindrical lead shield 18 in. diam. It has primary application among those manufacturers where inspection of parts is a necessarily thorough and

More For Details on these Items
Use Reply Card—Page 397



painstaking task. The radioactive source consists of three pellets of cobalt metal 1 cm diam and 1 cm long, which were irradiated in one of the nuclear reactors of the Atomic Energy Commission.

For More Details Circle No. 5—Page 397

Dust Collectors: Torit Mfg. Co., 301 Walnut St., St. Paul 2—Three cabinet type dust collectors equipped with large dust drawers have been added to the company's line. All are built into a cabinet 28 in. sq by 66 in. high with dust drawers having a capacity of 7 cu ft. Air capacities range from 11 to 300 cfm depending upon the power plant.

For More Details Circle No. 6—Page 397

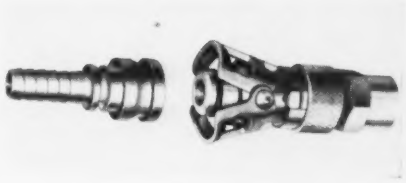
Casters: Bassick Co., Bridgeport 2, Conn.—Four medium duty casters feature shock absorbing, unit ball bearing, floating hub construction that provides load and floor protection. They especially are recommended by the manufacturer for safe moving of liquid and fragile solid loads of from 100 to 700 lb. Readily interchangeable with standard medium duty casters, they come with 5½ and 7-in. diam wheels in either swivel or rigid design and are available with rubber or semisteel tread wheels in 2-in. tread widths.

For More Details Circle No. 7—Page 397

Overload Protector: Morse Chain Co., 7601 Ceñeral Ave., Detroit 10— Slip-type friction clutch overload protection devices containing a powdered metal bushing on which such drive components as chain sprockets, V-belt pulleys or gears can be mounted have been developed for use with a wide variety of machine drives. Eleven standard models giving maximum torque capacities from 20 to 620 ft-lb are available. Typical applications include drives for conveyors, materials handling equipment, agricultural equipment and automated machine tools.

For More Details Circle No. 8—Page 397

Valve Coupling: C. B. Hunt & Son Inc., Salem, O.—Valve coupling assertedly gives the operator complete and safe control of the air line,

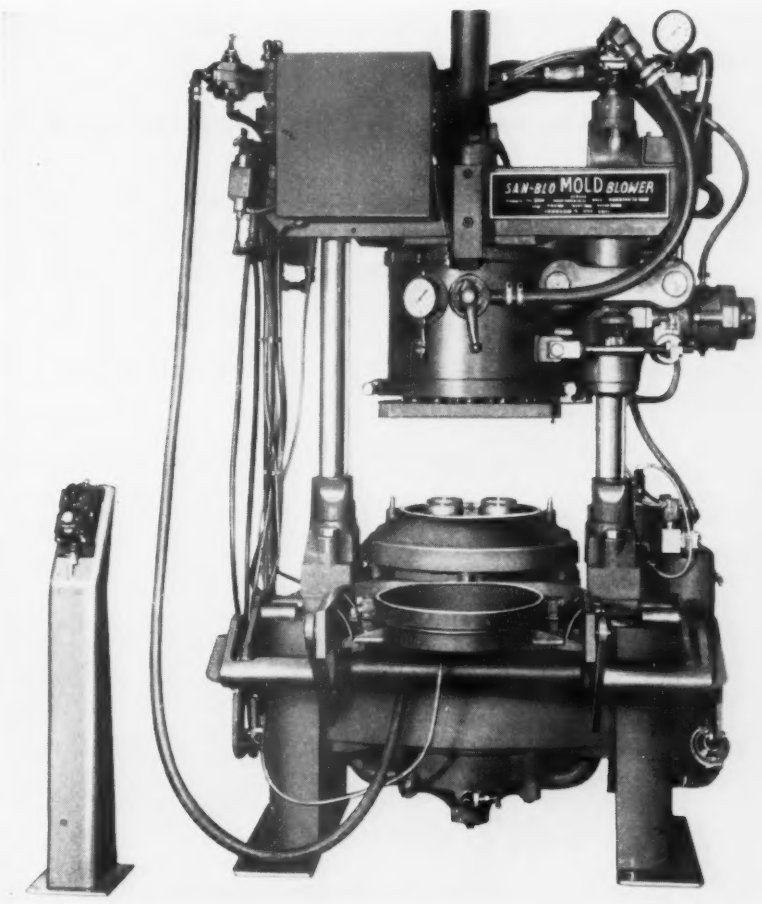


at whatever point it is installed between the compressor and air operated device. Jaw half of the coupling contains an "O" ring in a machined groove. When connected, the joint

Mold Blower Utilizes Low Pressure Prefill

MOLD blower makes use of a blow head and low-pressure prefill. The flask is first prefilled with loosely-packed sand, using but 10 lb air pressure, after which full line pressure is automatically cut in to pack the sand. An automatic, high-pressure, hydraulic squeeze then completes the mold. A recessed pattern plate is used to permit its being squeezed into the mold, to insure perfect definition and extremely hard and uniform mold surface against the pattern. The machine is fully automatic and can be operated by one man. Cope, drag or stack molds can be blown with minimum wear on pattern and flask and with automatic handling of the flask in and out of the machine. The blower is manufactured by the Federal Foundry Supply Co., located at 4600 East 71st St., Cleveland 5.

For More Details Circle No. 9—Page 397



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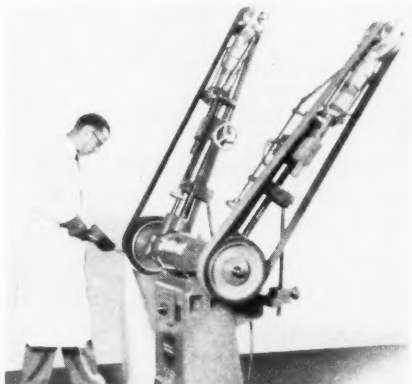
is sealed tightly by internal fluid pressure acting on this ring, but the two halves are able to swivel freely without leakage and at the same time prevent hoses from kinking. When connected and locked in the "on" position, the coupling cannot be disconnected. When in the "off and exhaust" position the air supply is trapped in the sliding sleeve to stop its flow. It opens ports through which air on the tool side can be exhausted to prevent damage to air tools not properly exhausted and avoids the danger of the hose end whipping around discharging high-pressure air. Couplings are available in ¼ to ¾-in. sizes with hose, or male and female pipe threads, and can be used with air to 250 psi.

For More Details Circle No. 10—Page 397

Contact Grinder: Curtis Machine Corp., 1300 East Second St., Jamestown, N. Y.—Several models of contact grinding and polishing machines made in Germany have been added to the company's line. All



models have approximate 18 in. belt adjustment, permitting use of one size belt with various diameter contact wheels. Either two belts, or a belt and grinding wheel, or buff can be employed. The machines are equipped with positive belt tracking devices and spring loaded belt tensioning. Dust proof ball bearings are used. Electric motors of varying horsepower are obtainable.

For More Details Circle No. 11—Page 397

Adhesive: H. V. Hardman Co., Belleville, N. J.—Industrial adhesive which bonds both similar and dissimilar materials is said to have superior bonding ability for metal-to-metal, metal-to-nylon and aluminum, steel, brass, copper, glass and nylon adhesions. Consisting of highly adhesive reactive resins in a solvent system, it requires no primer and is applied in solvent solution by brush, spray or dip to both parts. When all solvent has evaporated, the ad-

(*Continued on page* 399)

HELPFUL IDEAS FOR FOUNDRYMEN

HERE ARE QUICK REVIEWS OF NEW LITERATURE—available to foundrymen as "idea" and reference information. Readers in the United States and Canada may obtain copies by using the attached cards. Readers in foreign countries should write direct to the manufacturer offering literature.

100. Overhead Handling

Cleveland Crane & Engineering Co., Cleveland Tramrail Div., Wickliffe, O.—Engineering and application data for Cleveland Tramrail overhead materials handling equipment are found in 12-page illustrated brochure 2008J. System advantages, design options and accessories are included.

101. Dehumidifying Equipment

Pittsburgh Lectrodryer Corp., Foot of 32nd St., Pittsburgh 30, Pa.—32-page illustrated brochure No. 222 shows installations of Lectrodryers designed to dry air, gases and organic liquids to low dewpoints in keeping with quality control in humidity-sensitive operations. Design, engineering and application of system are all considered.

102. Ladle Graphitizer

United States Graphite Co., 1621 Holland Ave., Saginaw, Mich.—How No. 8 ladle graphitizer brings about low cost ladle graphitizing, effective chill reduction, accurate hardness control and good machinability is told in 8-page illustrated engineering bulletin No. 2. Methods of use are related.

103. Core Coating

Frederic B. Stevens Inc., 1800 Eighteenth St., Detroit 16, Mich.—Carbon blacking described in 4-page folder CB can be used as a core wash, mold wash (for skin dried molds) and dry sand blacking (for dry sand molds). It mixes easily with water for dip, spray or brush application.

104. Self-Dumping Hoppers

Roura Iron Works, Inc., 1401 Woodland Ave., Detroit 11, Mich.—"You can save 50% Labor Time with Roura Self-Dumping Hoppers" is title and subject of 4-page illustrated folder PM100. Several platform mounted and fork lift truck models are made with capacities up to 2 cu yd. Perforated units handle hot castings and forgings.

105. Shot Blast Lines

Latrobe Steel Co., Special Products Div., Latrobe, Pa.—Designed for use in Wheelabrator shot blasting machines, type BR-4 liners are covered in 12-page illustrated catalog. Vanadium steel composition gives long lasting properties.

106. Dust & Fume Control

American Wheelabrator & Equipment Corp., 862 S. Byrkit St., Mishawaka, Ind.—Knocked down and assembled Dustube dust collectors are described and illustrated in the 8 pages of condensed catalog 372. Units use cloth filter tubes and can handle hot and/or corrosive gases such as those found in foundries. Specifications and data on various models are included.

107. Crane Cab Conditioning

Dravo Corp., 605 Dravo Bldg., Fifth & Liberty Ave., Pittsburgh 22, Pa.—24-page illustrated bulletin No. 1301 covers crane cab coolers and air conditioners in various styles and sizes to suit any standard cab. Complete data are given.

108. Wire Rope

Macwhyte Co., Kenosha, Wis.—Illustrated bulletin 50-25 contains 4 pages of factual data on selection and ordering of industrial wire rope in various strand patterns and wide range of breaking strengths. Diameters range from 3/16 to 3 1/8-in.

109. Portable Pyrometer

Illinois Testing Laboratories, Inc., 420 N. La Salle St., Chicago 10, Ill.—Accurate temperature measurements can be made under severe operating conditions by the Alno Pyro Lance portable pyrometer for nonferrous foundries. Unit is described and illustrated in bulletin 1724-D. Prices and specifications are given.

110. Electric Hoists

Harnischfeger Corp., 4400 W. National Ave., Milwaukee 46, Wis.—Wide variety of applications for P & H electric hoists are shown in 48-page illustrated bulletin H5-1. Their design and construction features and their specifications are given. Capacities range from 1000 to 30,000 lb with lifts from 9 to 60 ft.

111. Iron Melting

H. A. Reece, 140 S. Hibiscus Dr., Miami Beach 39, Fla.—4-page bulletin describes Reecemelt, a patented method for making iron. It also describes a new cupola windbox and control tests related to light, medium and heavy castings production.

112. Miscellaneous Equipment

Foundry Flask & Equipment Co., Northville, Mich.—Variety of types of foundry flasks are briefly described and illustrated in 4-page bulletin. Lightweight and heavy duty units for standard and special applications are shown, as are irregular shaped flasks and automation equipment.

113. Mold Release Agent

Injection Molders Supply Co., 3514 Lee Rd., Cleveland 20, O.—Data sheet briefly describes IMS silicone mold release agent available in pressurized can dispenser.

114. U. S. Constitution

W. S. Tyler Co., Superior Ave. & E. 36th St., Cleveland 14, O.—Volume 45, No. 4 of company publication "Through the Meshes" offers a complete reprint of the Constitution of the United States. Issue is printed in the belief that a re-reading of

Additional Information?

For additional information on any of the items described under "New Equipment and Supplies." "Trade Publications" or "Ideas for Foundrymen" in this issue—simply circle corresponding item numbers on accompanying cards

the Constitution will help shed light on the basic troubles of this country at the present time.

Helpful IDEAS

115. Bin Level Indicators

Bin-Dicator Co., P.O. Box 3708, Detroit 15 Mich.—Quick facts about Bin-Dicator bin level indicators and Bin-Flow aerator units are provided in condensed catalog sheet No. BD-4B. General specifications and price list are included.

116. Recirculating Furnaces

Despatch Oven Co., 619 S. E. Eighth St., Minneapolis, Minn.—Many designs of recirculating furnaces in operation on variety of heat treating applications are illustrated in 12-page bulletin 81. Performance records are given in several instances and a double-page spread of specifications for pot, batch and conveyor type furnaces is featured.

117. Industrial Washers

Detroit Sheet Metal Works, 4444 Cass Ave., Detroit 1, Mich.—Pictured in 4-page folder 52-4 are five installations of industrial washing machines. Systems include those for handling aircraft parts and motors, small parts, auto frames and agricultural equipment parts.

118. Inspection Instruments

Eder Instrument Co., 2293 N. Clybourn Ave., Chicago 14, Ill.—Several models of the Eder Inspectroscope for visual inspection of pockets, corners and joints inside of castings are illustrated and described in 4-page folder. Standard flexible and rigid units are shown as well as model E.C.M. which features controlled flexibility.

119. Building Maintenance

Stonhard Co., 1306 Spring Garden St., Philadelphia 23, Pa.—6-page illustrated folder MP-M254 covers use of such building maintenance products as floor resurfacers, roof resurfacers and water-seepage stoppers. Application photos are given and economies illustrated.

120. Sand Reclamation

Hydro-Blast Corp., 2550 N. Western Ave., Chicago 47, Ill.—To estimate possible annual savings through use of Hyro-Blast sand reclamation method, company offers Self-Survey form S-200.

121. Mix-Muller

National Engineering Co., 549 W. Washington Blvd., Chicago 6, Ill.—No. 1 model F mix-muller designed for small foundries and with 500-lb batch capacity is covered in 2-page illustrated data sheet. Specs and features are given in bulletin 516.

122. Storage Systems

Marietta Concrete Corp., Marietta, O.—"Modern Industrial Storage Systems" is title of 12-page illustrated bulletin showing adaptability of concrete silos with capacities ranging from 4520 to 35,300 cu ft. Catalog covers integration of existing or special purpose loading and unloading equipment, in addition to giving engineering data.

123. Hydraulic Cylinders

Miller Fluid Power Co., 2040 N. Hawthorne Ave., Melrose Park, Ill.—High pressure cylinders made to JIC standards are covered in 8-page illustrated bulletin H-104G. Design features of a complete line, with bores ranging from 1½ to 12 in. and for service from 2000 psi and up, are given, together with mounting and other data.

124. Car Pullers

Jeffrey Mfg. Co., Columbus 16, O.—Illustrated bulletin 861 gives four pages of information on all-purpose car pullers types 240-A and 250-A, having starting rope pulls of 5000 and 10,000 lb. Maximum rope speed of both units is 45 fpm. Standard data are provided.

125. Core and Mold Wash

Delta Oil Products Co., Teutonia Ave & Mill Rd., Milwaukee 9, Wis.—Special core and mold wash for general purpose foundry use is described in 4-page illustrated bulletin. Mixing and application instructions are given. Other foundry products such as mudding compounds, core oils and spray binders are shown.

126. Belt Fasteners

Flexible Steel Lacing Co., 4607 Lexington St., Chicago 44, Ill.—Belt fasteners and rip plates for joining conveyor and elevator belts of any width made in steel and stainless and other alloys are covered in illustrated bulletins F-106 and F-100. Installation instructions, tools and accessories are shown and available sizes given.

127. Melting Furnaces

Reda Pump Co., Furnace Div., Bartlesville, Okla.—Reflecting type ferrous and nonferrous alloy melting furnaces in three series are described in 4-page illustrated bulletin. Capacities per heat range from 400 to 1000 lb for iron and 450 to 1150 lb for bronze. Furnaces are equipped for rapid change from one fuel source to another. Mounting and other technical data are given.

128. Pneumatic Conveyor

Crane Co., 836 S. Michigan Ave., Chicago 5, Ill. — Turbo-Drive pneumatic pipe line conveying system for transporting sand and other bulk materials is covered in 4-page illustrated form AD-1906. System, which is controlled by a single operator, is available in varying capacities and can be operated automatically or semiautomatically.

129. Tractor Shovels

Allis-Chalmers Mfg. Co., Tractor Div., Milwaukee 1, Wis.—Large folding type brochure "Insist on Both These Essentials. . . ." gives design details and specifications on line of 1, 2, 3, and 4-yard tractor shovels. Handling convenience and versatility are both pointed up.

130. Foundry Equipment

Denver Equipment Co., 1400 Seventeenth St., Denver 17, Colo.—12-page illustrated bulletin G3-B46 gives broad view of job-engineered foundry and mill equipment, including waste treatment, coal preparation and other items. Plant design service is described at length.

131. Carbon Control

United States Graphite Co., Saginaw, Mich.—Mexite alloying graphitic carbon briquets for carbon stabilization and control in cupola charging are covered in illustrated 4-page bulletin. Product can be used for carbon raising throughout or at any time during the heat.

132. Sand Control

Claud S. Gordon Co., 3000 S. Wallace St., Chicago 16, Ill.—"Taking the Mystery out of Sand Control" is an illustrated booklet of 32 pages which covers selection of foundry sands, control of moisture content, control of green strength and permeability and control of core practice. Correction of defects and testing procedures are also detailed in the booklet.

133. Power Conveyors

Richards-Wilcox Mfg. Co., Materials Handling Div., Aurora, Ill.—68-page well-illustrated bulletin deals with continuous power conveyor installations, equipment and design. Complete data are given on all design aspects, including standard and special arrangements.

134. Shell Molding Resin

Bakelite Co., 30 E. 42nd St., New York 17, N. Y.—Technical 4-page bulletin on type BR-12011S phenolic resin for shell molding process gives performance data on the resin, an all-purpose type which can be subjected to a wide variety of operating conditions without detriment. Table shows relationship of flexural strength to curing time.

for Foundrymen

135. Cupola Gases

Whiting Corp., Harvey, Ill.—6-page illustrated folder FO-9 gives technical data on foundry cupola gases and temperatures. Text and charts further understanding of the troubles encountered from "low beds" and "oxidized iron" and of their causes.

136. Materials Handling

Rapids-Standard Co., Grand Rapids 2, Mich.—Field reports No. 37 and 43 deal with applications of materials flow and conveying equipment, respectively. Text and illustrations show savings made in particular instances.

137. Sand Coating

Whitehead Brothers Co., 324 W. 23rd St., New York 11, N. Y.—Description of and procedure for using the Lyquaface process for increasing the permeability of sand is given in this 28-page booklet. Suggestions for preparation of Lyquaface sand are made and method for obtaining desired effects is detailed. Other Whitehead products are described.

138. Rough Grinding Wheels

Norton Co., Worcester 6, Mass.—Use of various types of Norton wheels for rough grinding in foundries, welding and forge shops is covered in detail in 60-page illustrated booklet 1405. Among contents are wheel selection, floorstand, portable and swing frame grinding, wheel shapes, grinding cost, cut-off wheels and a table of speeds.

139. Machine Tools

Rockwell Mfg. Co., Delta Power Tool Div., 400 N. Lexington Ave., Pittsburgh 8, Pa.—Extensive 72-page illustrated catalog AB-53 contains descriptions and specifications for line of industrial machine tools, including band saws, cutoff machines, drill presses, grinders, motors, saws and many others.

140. Blast Cleaning Machine

Pangborn Corp., Hagerstown, Md.—How the Blastmaster Rotoblast cleaning machine for castings, forgings and heat treated parts operates, its construction features and its dimensions and specifications are covered in detail in 16-page illustrated brochure 223A. Models of 3, 6, 12 and 18 cu ft are available.

141. Corebox Vents

C. M. Smillie & Co., 1120 Woodward Heights Blvd., Ferndale 20, Mich.—Slotted corebox vents for blowing cores are subject of 4-page illustrated folder. Also included are drill for inserting the core vents and a vent cleaner.

142. Shell Pour-Off System

Arrow Pattern & Engineering Co., 2340 McKinley Ave., Erie, Pa.—Description and illustration of the Arrow shell pour-off system is found in this folder. System can be set up to conform to present melting or pouring arrangements. It is shipped ready for assembly.

143. Flasks & Jackets

Fremont Flask Co., 1000 Wolfe Ave., Fremont, O.—Data on the magnesium Spreadlock flask with replaceable live rubber corner inserts are contained in series of data sheets. Also detailed are tapered magnesium slip flasks and cast iron and aluminum standard or ribbed jackets.

144. Foundry Chills

Fanner Mfg. Co., Brookside Park, Cleveland 9, O.—28-page form No. 1153 illustrates and specifies wide variety of chills which can be furnished coated with pure hot tin or copper. Special chills cast, stamped or forged to specification are available as well. Supplementary price list is provided.

145. Alloy Addition Agents

Specialloy Inc., 4025 S. Keeler Ave., Chicago 32, Ill.—Electric furnace alloy addition agents and products described in 8-page brochure are made to fit the use. Wide range of nonferrous and ferrous compositions are produced in shot, ingot, plate and billet forms.

146. Backstand Idler

Carborundum Co., Niagara Falls, N. Y.—The "61" universal backstand idler attachment for all types of wall, bench and floor coated abrasive backstand grinding is subject of 4-page illustrated bulletin A-1262. Designed for heavy and light duty grinding, it uses belts from ½ to 8 in. wide.

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147. Air Weight Control

Foxboro Co., Foxboro, Mass.—Bulletin 268-3 of 12 illustrated pages is devoted to the principle and importance of air weight control as applied to foundry operations. Installable on your present blower, the control makes for more uniform melts, lower power costs and prolonged refractory life. Supplementary data sheet describes a typical cupola application.

148. Molding Machines

W. H. Nicholls Co., Richmond Hill, Long Island, N. Y.—Series of jolt-squeeze and pattern draw molding machines are described in series of five 4-page illustrated bulletins. Covered are heavy-duty, stationary and portable machines of various capacities for jobbing and production work.

149. Industrial Ovens

Lanly Co., 750 Prospect Ave., Cleveland, O.—Design features, instrumentation and other details of Lanly industrial ovens are found in 16-page illustrated catalog 520. Illustrated are typical foundry, finishing, heat treating, ceramic and chemical ovens of various types.

150. Industrial Gearing

Michigan Tool Co., Cone-Drive Gears Div., 7171 E. McNichols Rd., Detroit 12, Mich.—"Cone-Drive Gears at Work in Industry" is a 36-page booklet (CD-173) which shows applications of gearing in a highly diversified series of installations numbering 93 in all.

151. Sand Conditioner

Hercules Powder Co., Naval Stores Dept., 920 King St., Wilmington 99, Del.—Effect of NVX, a dry, pulverized, water-soluble neutral resin, on green sand properties is related in this 12-page bulletin, identified as form 400. Use in various types of molding, laboratory test procedures and effect on elevated temperature properties is covered. Many data are in table form.

152. Refractories

Chicago Fire Brick Co., 1467 N. Elston Ave., Chicago 22, Ill.—Three available data sheets provide essential information on plastic and castable refractories as well as cements and mortars. Maximum service temperatures for refractories range from 1500 to 3100° F.

153. Grinding Wheels

Cleveland Quarries Co., Sterling Abrasives Div., Tiffin, O.—"The Wheels of Industry" is title of 4-page form 1253 which tabulates specifications for cylindrical, internal, tool room, centerless and surface segmental grinding wheels.

154. Cut Wire Shot

Metals Disintegrating Co., Harrison Abrasive Div., Elizabeth B, N. J.—5-page technical bulletin is entitled "Cut Wire Shot, Its Development and Use." Tabulated SAE specifications for nine different sizes are provided. Shot is produced by cutting or shearing wire so that length of cut equals diameter of wire.

155. Power Bulk Handlers

Butler Bin Co., Carscoop Div., Waukesha, Wis.—Cullet, ingots, coal, metal scrap, chemical and ceramic materials, metallic concentrates, fertilizer and granular materials, sand and cement are among bulk materials easily handled by Carscoop and Yardscoop handling trucks. Former is made in both gasoline and electric powered models. Eight-page bulletin 250 A gives the "scoop" on these units.

156. Fork-Lift Truck

Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.—Capacity of 10,000 lb at 24 in. is featured by gas-powered fork-lift Utilitruc 100 described and specified in 4-page form SS652. Unit is powered by six-cylinder, 50-bph engine and has speed up to 6 mph.

157. Electrode Stabilizer

Fred C. Archer, Inc., 606 W. Wisconsin Ave., Milwaukee 3, Wis. — Blueweld low-hydrogen electrode stabilizers are pictured and described in 4-page folder. These units protect electrodes during storage by constantly surrounding them with heated dry air which quickly removes all traces of moisture. Two models accommodate 18 and 24 in. electrodes.

158. Electric Furnaces

Kuhlman Electric Co., Detroit Electric Furnace Div., Bay City, Mich.—Three available data sheets describe type PT, type GMS rocking and type IC electric furnaces. Capacities are 12 kw, 15 lb; 30 kw, 60 lb; and 12 kw, 10 lb, respectively.

IMPORTANT READING FOR FOUNDRYMEN
We have a limited quantity of the following reprints which we can furnish while they last.

159. Statistical Quality Control

Application of statistical quality control to the foundry is covered in this reprint of a recent FOUNDRY article, written by A. J. Kukla of Alcoa's Buffalo works. Although it covers application to a magnesium sand foundry, the principles and benefits described apply to other types of foundries. The use of charts is covered.

160. Grain Refinement

"Grain Refinement of Magnesium Castings" is a reprint of a FOUNDRY article by Robert T. Wood of Aluminum Co. of America which details use of hexachlorobenzene as a grain refining agent for magnesium. It gives improved metal properties and lower operating costs.

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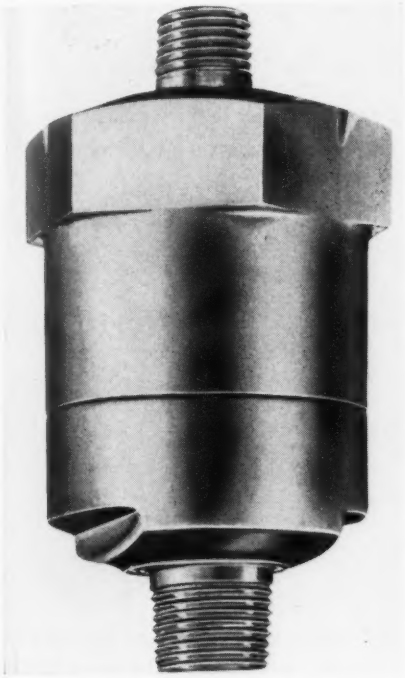
(*Continued from page* 394)

hesive is tackfree and remains so. Parts to be assembled then are held together under gentle pressure. For maximum bond and chemical and solvent resistance, application of heat while the parts are held together is recommended.

For More Details Circle No. 12—Page 397

Automatic Drain: Wilkerson Corp., 3367 South Platt River Dr., Englewood, Colo.—Low pressure automatic drain unit for compressed air systems opens when pressure drops past 10 psi allowing all moisture to be blown out before line pressure reaches zero. As pressure builds up again the drain unit closes, or resets, as pressure rises past 10 psi. Unit is designed to drain compressed air systems of condensation automatically in the course of closing down or at overnight periods. While 10 psi is the standard operating pressure, lower or higher pressures can be used as the setting. It is claimed the unit cleans lines or tanks with minimum air loss.



For More Details Circle No. 13—Page 397

Front End Loaders: Transo Division, Le Roi Co., 1706 South 68th St., Milwaukee 14—Front end loaders ranging in size from ½ to 1½-yd capacity feature torque converter, power steering and reversing planetary transmission as standard equipment. Bucket rocking action and the scooping motion of the lift arms assertedly assure full bucket load within seconds without tire spinning and other undue strain on the loader. Speed ranges up to 18 mph. Four-wheel drive and a low center of gravity give powerful traction. Heavy

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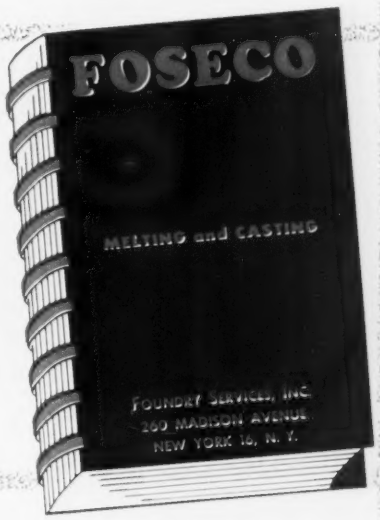

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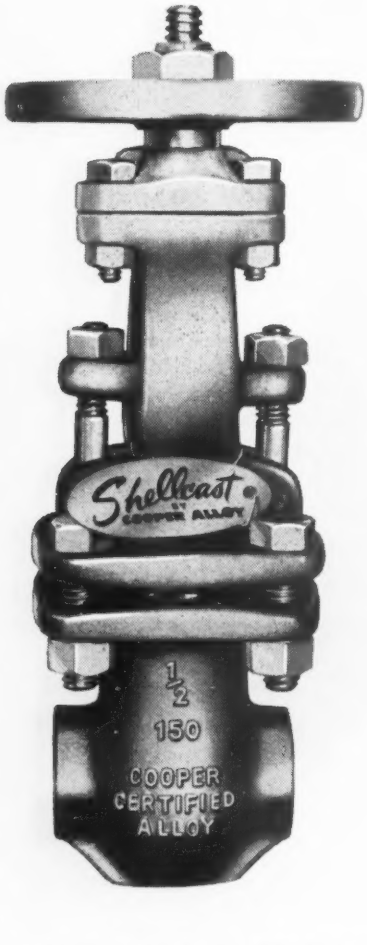

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Mr. Morton Katz, Shell Mold Engineer, The Cooper Alloy Foundry Co., Hillside, New Jersey, reports:

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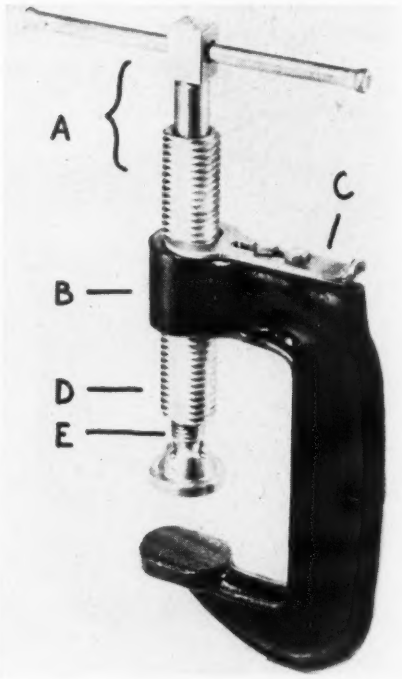
cast iron grills on all units give extra protection to the rear ends and act as counterweights.

For More Details Circle No. 14—Page 397

Pressure C-Clamp: Techn Products Inc., 1908 East 66th St. Cleveland — C-clamp with pressur screw that quickly adjusts in lengt has no ratchets or springs. A quarter turn in either direction releases



the pressure screw assembly (A) so it slides in and out of threaded hub (B). The assembly can be positioned against the work, re-engaged and tightened in the usual manner. Sliding thumb lock (C) holds assembly in locked position. Two sides of the outer barrel (D) are milled flat to match grooves in the inside thread of the hub. Such an arrangement makes the entire length of the screw (E) quickly available.

For More Details Circle No. 15—Page 397

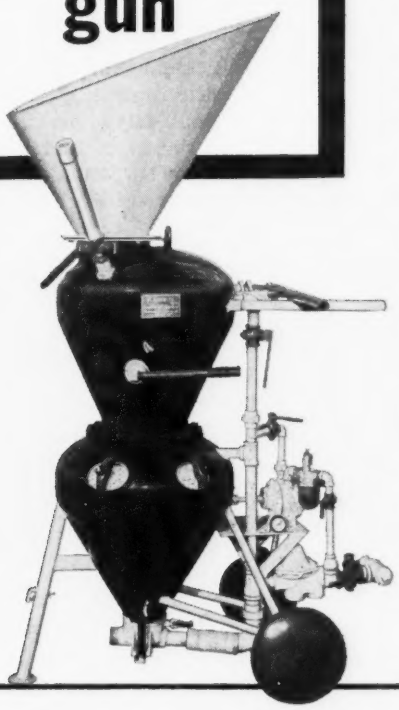
Die Grinder: Cleco Division, Reed Roller Bit Co., Houston, Tex.—Series of grinders for heavy duty die grinding or lighter finishing jobs are available in a variety of styles, featuring different throttles and wheels, as well as different free motor speeds. Splined couplings permit quick removal of the grinding wheel shaft and bearing without disassembling the motor.

For More Details Circle No. 16—Page 397

Electric Motors: Sterling Electric Motors Inc., 5401 Telegraph Rd., Los Angeles 22—Normal speed electric motors in frame sizes 182 and 184 incorporate new NEMA approved standards which specify more horsepower from the volume of space oc-

(*Continued on page* 402)

The Blastcrete gun



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Compton Foundry
Compton, Calif.
Canada Iron Foundries Ltd.
Three Rivers, Quebec

The Davis Fire Brick Company
Oak Hill, Ohio
Dayton Foundry
Hollydale, Calif.
Duquesne Light Company
Pittsburgh, Pennsylvania
The Eastern Malleable Iron Co.
Wilmington, Delaware
Fraters Valve and Fitting Co.
Los Angeles, Calif.
General Metals Corporation
Los Angeles, Calif.
Great Lakes Founders & Machine Corp.
Ludington, Michigan
Gregg Iron Foundry
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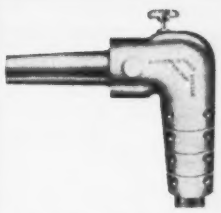

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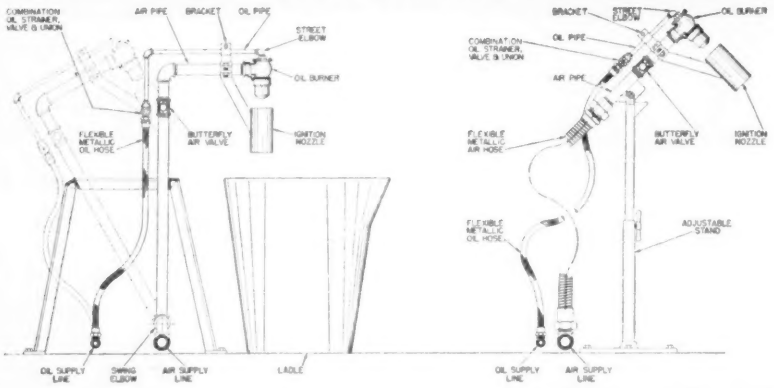
Low-Pressure Ladle Heaters Can Be Tilted



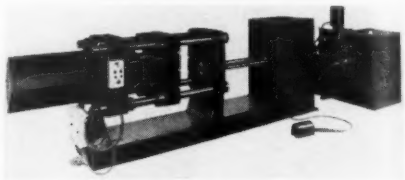
LOW-PRESSURE air type oil burners permit tilting of burner for placing and removing of ladle or crucible. Burner is reported to give perfect atomization of fuel oil with low-pressure blower air usually at pressures from 16 to 20 oz. Electric power consumption of the blower is only one-fourth that of an air compressor. Single or multiple burners can be served by the same blower. Manufacturer claims that the burner gives a wide rage of capacity with a more luminous flame and quieter operation than with high-pressure air type burners. Two alternate arrangements are possible depending upon the application. These ladle heating arrangements are manufactured by Hauck Mfg. Co., 124-136 Tenth St., Brooklyn 15, N. Y.

For More Details Circle No. 17—Page 397

seal on the pulley end protects open motors. A plug seals the short end bearings. New brackets give greater protection to windings, and improved insulation provides greater electrical and mechanical strength to stator windings. Windings are protected by a heat-resistant baked varnish and moisture-resistant sealer.

For More Details Circle No. 18—Page 397

Die Casting Machine: Harvill Mfg. Co., Corona, Calif.—Cold chamber type die casting machine for casting aluminum alloys, magnesium and brass reportedly can be converted without delay to hot chamber operation for zinc, lead and tin. Unit permits up to 300 complete casting cycles per hour. High-pressure oil hydraulic system supplies the operating and injection power for the unit and exerts up to 11,800 psi on the molten metal as it solidifies. Design is said to facilitate fast, easy die changes. As a safety feature, molten metal cannot be injected unless the dies are fully closed and locked under 300-

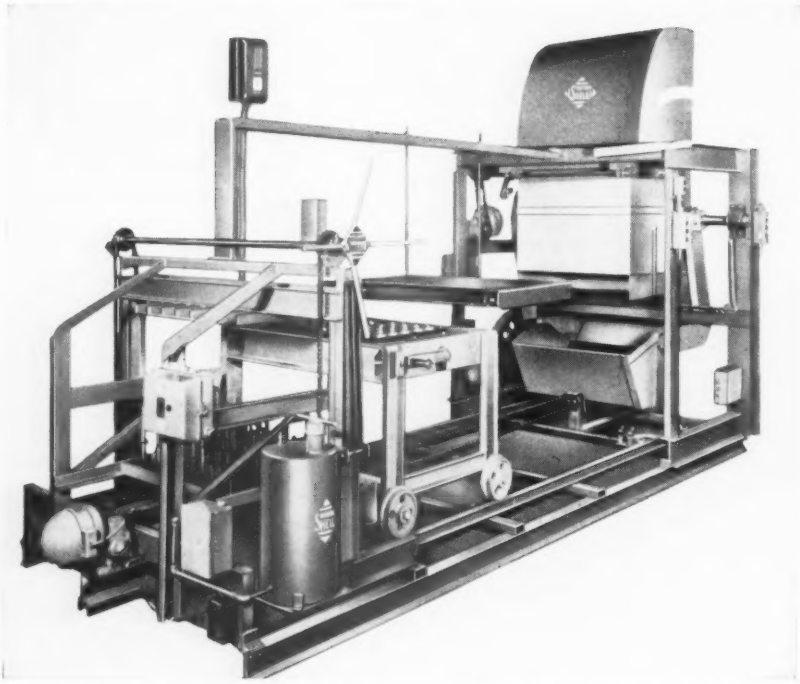


(*Continued on page* 404)

(*Continued from page* 400)

cupied. More than 50 per cent of the inactive space in previous designs has been eliminated. Diagonal cover type boxes may be rotated 360 degrees to be fixed in any position desired and have tapped hole for conduit. Moisture - resistant labyrinth

Shell Machine Produces More than 60 Molds per Hour



A NEW model shell molding machine uses vertical drop over entire pattern area from a special hopper designed to eliminate air pockets and cover every part of pattern with a depth sufficient to assure a dense but permeable mold. Full 360 degree rotation of pattern eliminates tendency to peel off. Uncured shells do not sag. A dust-tight hood encloses pattern and carrier during the investment period. Heated pattern and curing hood are ample for more than 60 shell molds per hour. Functional units are separated for better control and permit inspection at any point in the cycle. Oven type heated pattern carrier assures even heat distribution. Curing hood may be gas or electrically heated.

The stabilized cured shell mold is stripped downward onto a cushioned receiver conforming to the contour of the back of the shell. The pattern carrier carriage may be controlled manually or automatically. The machine is manufactured by Southern Shell Mold Equipment Co., Chattanooga, Tenn.

For More Details Circle No. 19—Page 397

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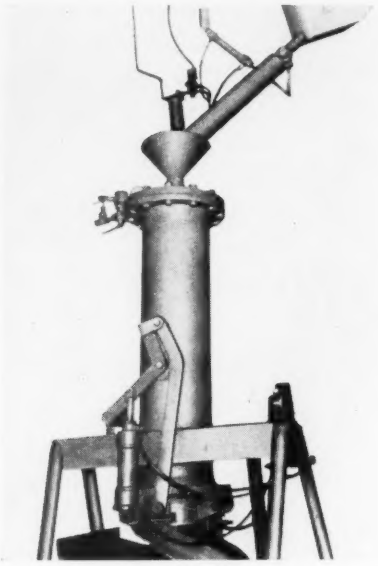
(*Continued from page* 402)

ton pressure. Cores can be pulled in all directions and can be operated manually, hydraulically or mechanically. The self-contained power unit may be placed in any position relative to the die clamping part of the machine.

For More Details Circle No. 20—Page 397

Pressure Filter: Hydro - Blast Corp., 2550 North Western Ave., Chicago 47—Pressure filter dewaters granular materials. Material is fed



into the machine in slurry form and is discharged at less than 10 per cent moisture content by weight. Operation is fully automatic through use of electric timers. Shop air at 85 psi is employed for dewatering, with average air consumption of 15 cfm. Power is required only for solenoid valves and timer. Capacities range up to 5 tons per hour of 100 lb per cubic foot material.

For More Details Circle No. 21—Page 397

Conveyor Belts: B. F. Goodrich Co., Akron, O.—Hot material conveyor, belts made with rayon fabric reinforcement are said to be thin, to dissipate heat quickly and to offer great ply adhesion. In addition, they retain their strength extraordinarily well when exposed to high temperatures, according to the manufacturer. The firm also offers a nylon breaker which resists formation of transverse cracks and prevents penetration of such cracks to the carcass.

For More Details Circle No. 22—Page 397

Insulating Cement: Kragor Corp., 884 North Graham St., Allentown, Pa.—Insulating cement is reported to bond to any clean, dry surface and to be noncombustible, non-

(*Continued on page* 406)

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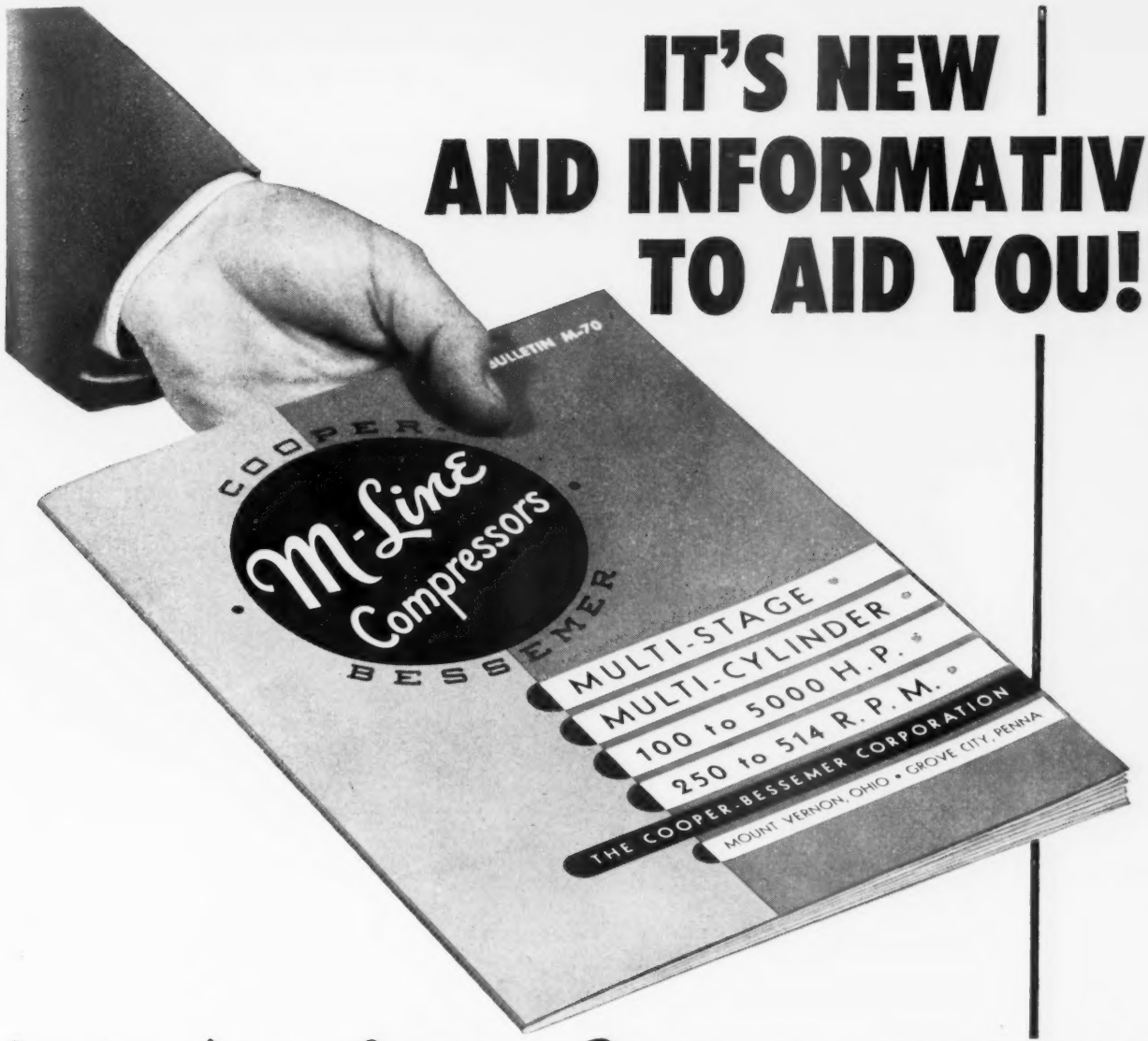

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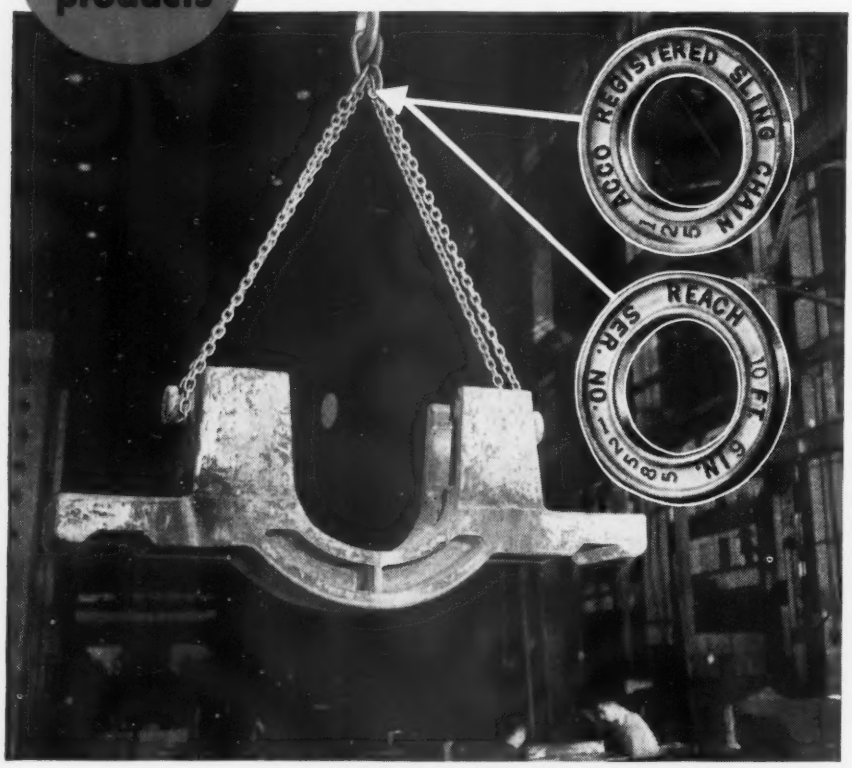
ACCO products

ACCO Registered* Sling Chains



What would it cost you if you dropped this casting?

• How many times a day do you gamble with a heavy load being lifted over expensive machines—or men? If you have ever dropped a load, you know the consequences. Time lost, damages—a general mess.

That's why you must be sure of the slings you use. That's why we suggest ACCO *Registered* Sling Chains with their inherent safety. For instance, a ⅜" ACCO *Registered* Sling Chain used in a double-basket hitch at a 60° angle has a working load limit of 11,400 pounds, almost six tons! Furthermore—it was proof-tested—overall—with a load equivalent to *twelve tons.*

With all this strength, ACCO *Registered* Sling Chains are light in weight . . . easy for your men to handle. That's because they're made of alloy chain which provides strength, great strength, with less weight.

There's much more to tell about these fine ACCO *Registered* Sling Chains. Call your ACCO *Registered* distributor today or write us for literature.

WHAT "ACCO REGISTERED" MEANS . . .

1. The best material
2. Unit safety factor (on bodies, rings, links, hooks)
3. Proof test of complete sling to twice the working load limit
4. Actual field service test of each design
5. Metal identification ring on each sling
6. Signed Registry Certificate with each sling

*Trade Mark Registered

ACCO TRADE MARK

American Chain Division
AMERICAN CHAIN & CABLE
York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

plus Rings Links Hooks

(*Continued from page* 404)

shrinking, antisweat, moldable and easy to apply. It has a gripping power of 41.7 psi and will adhere to steel, concrete, tile, glass, wood, cement blocks or plaster board, including smooth, curved and irregular surfaces. The cement comes in two types, one for antisweat applications such as on fittings, pumps, tanks and similar equipment 0 to 212°F, the other for similar applications at higher temperatures. Furnished as a dry mix, it is prepared for application by the addition of a measured amount of water and by mixing in a power plaster mixer.

For More Details Circle No. 23—Page 397

Controller-Indicator: Blue M Electric Co., 306-308 West 69th St., Chicago 21—Portable electronic con-

troller-indicator can be used as an automatic temperature controller, an excess temperature cutoff or a verifier of temperatures of other controllers. It will measure and control directly the temperatures of ovens, furnaces, kilns, liquid baths and other, related controlled equipment. As an excess temperature cutoff, the instrument shuts off automatically until manually reset. It can be wall mounted, including remote wall mounting. Circuit breaker switch gives protection against shorts and overloads. Available in two scale ranges, units are supplied with a No. 8 gage thermocouple 18 in. long and with 10 ft of lead wire.

For More Details Circle No. 24—Page 397

Volt-Ampere Tester: Pyramid Corp., Lynbrook, N. Y.—Each of three high voltage models added to the company's line of pocket volt-amp testers comes with two voltage ranges, 0-150/600-v ac, and is available in an ammeter range of 0-25, 0-50 or 0-100-amp ac. Also available are 0-125/150-v models, in current ranges of 0-10, 0-25, 0-50 and

(*Continued on page* 408)

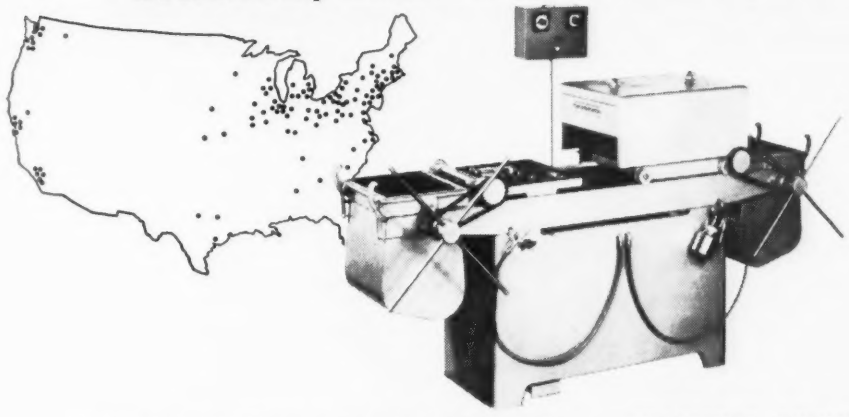
NOW_
SHELL CORES
FOR

Shalco Engineering Corporation, first to offer the foundry industry a low cost high production shell molding machine, has pioneered again in development of the first efficient, economical, highly productive shell core machine.

Shell cores offer to green sand, permanent mold and shell mold foundries all the precision, quality finish, high production rate and other benefits of shell molding. Shell cores are light, precise, economical (savings up to 80%), vent readily, offer excellent collapsibility. They produce a smooth finish on interior surfaces that are difficult to machine.

GREEN SAND MOLDS • PERMANENT MOLDS • SHELL MOLDS

SHALCO, America's most popular Shell Molding Machine



Visit the Shalco exhibit
at the
National Foundry Convention
Booth 1013
May 8 to 14
Cleveland, Ohio

SHALCO ENGINEERING CORPORATION
81 Encina Ave., Palo Alto, Calif.

SHALLWAY CORPORATION
So. Fourth St., Connellsville, Pa.

SHALCO

(*Continued from page* 406)

0-100 amp. These units are said to do the work of a voltage tester, with instrument accuracy on a calibrated scale, and to give an instant current reading without the need to shut down equipment.

For More Details Circle No. 25—Page 397

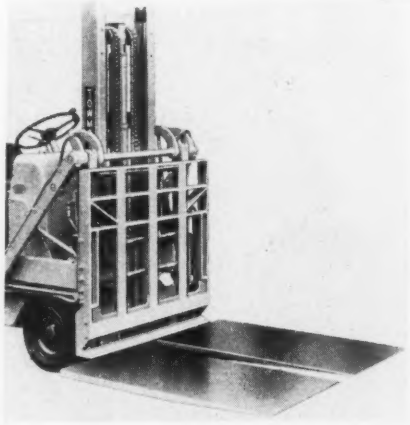
Hydraulic Valves: Hydraulic Press Mfg Co., Mount Gilead, O.—Line of hydraulic valves consists of more than 3500 models, including directional and functional types, each available with optional body styles, types of control, methods of operating and other features for universal application. Features include full floating operating lever on directional valves, "O" ring seals, long lands on both the valve body and spool, selectively fitted spools, machined inlet and cylinder ports and interchangeable end caps.

For More Details Circle No. 26—Page 397

Aluminum Roofing: Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19—Company has added a lightweight corrugated aluminum sheet 0.024-in. thick to its line of industrial roofing materials, which already included a 0.032-in. thick sheet of the same alloy. The lighter sheet will fill the need where narrow spans in a roof support structure do not require the extra beam strength of the 0.032-in. material. The new sheet is supplied with corrugations ⅞ in. deep and with a 2.67-in. pitch. It can be used for both new construction and for reroofing jobs. All fasteners and erection methods used with the 0.032-in. sheet are equally applicable to the 0.024-in. product.

For More Details Circle No. 27—Page 397

Materials Handling: Towmotor Corp., 1226 East 152nd St., Cleveland 10—Handling device permits use of



thin pallet sheets instead of fork entry type pallets for handling of unit loads. Gripping device is built into the pusher frame of the unit, which pulls the palletized load onto either forks or blades and pushes it off at setdown points. Inexpensive pallet sheets are left with unit load so a similar handling device at the receiving end can unload the carrier. Once the unit loads have been placed on the pallet sheets, all further handling operations are completely mechanical.

For More Details Circle No. 28—Page 397

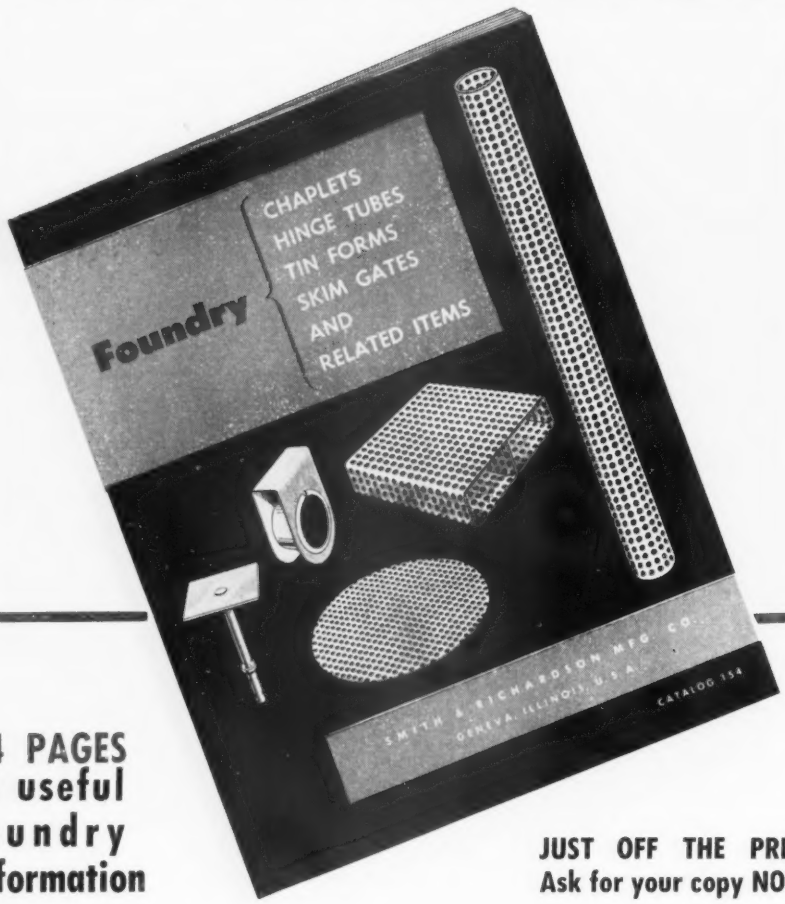
Conveyor Lubricator: Moore Lubricator Co., 355 Lynwood Lane, Milwaukee 14—Fully automatic, air operated trolley type conveyor lubricator for oil or grease, or combinations of both, reportedly makes possible lubrication of monorail conveyor wheels at no cost for labor. Models available for 3, 4 and 6-in. I-beam rails.

For More Details Circle No. 29—Page 397

Photocopier: Copease Co., 270 Park Ave., New York—German-developed electric typewriter size photocopying machine is reported to produce permanent, fadeproof black and white duplicates in less than 45 seconds on paper of any weight. Original and a sheet of negative first

(*Continued on page* 410)

CHAPLET CATALOG



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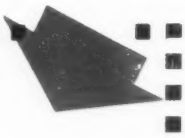

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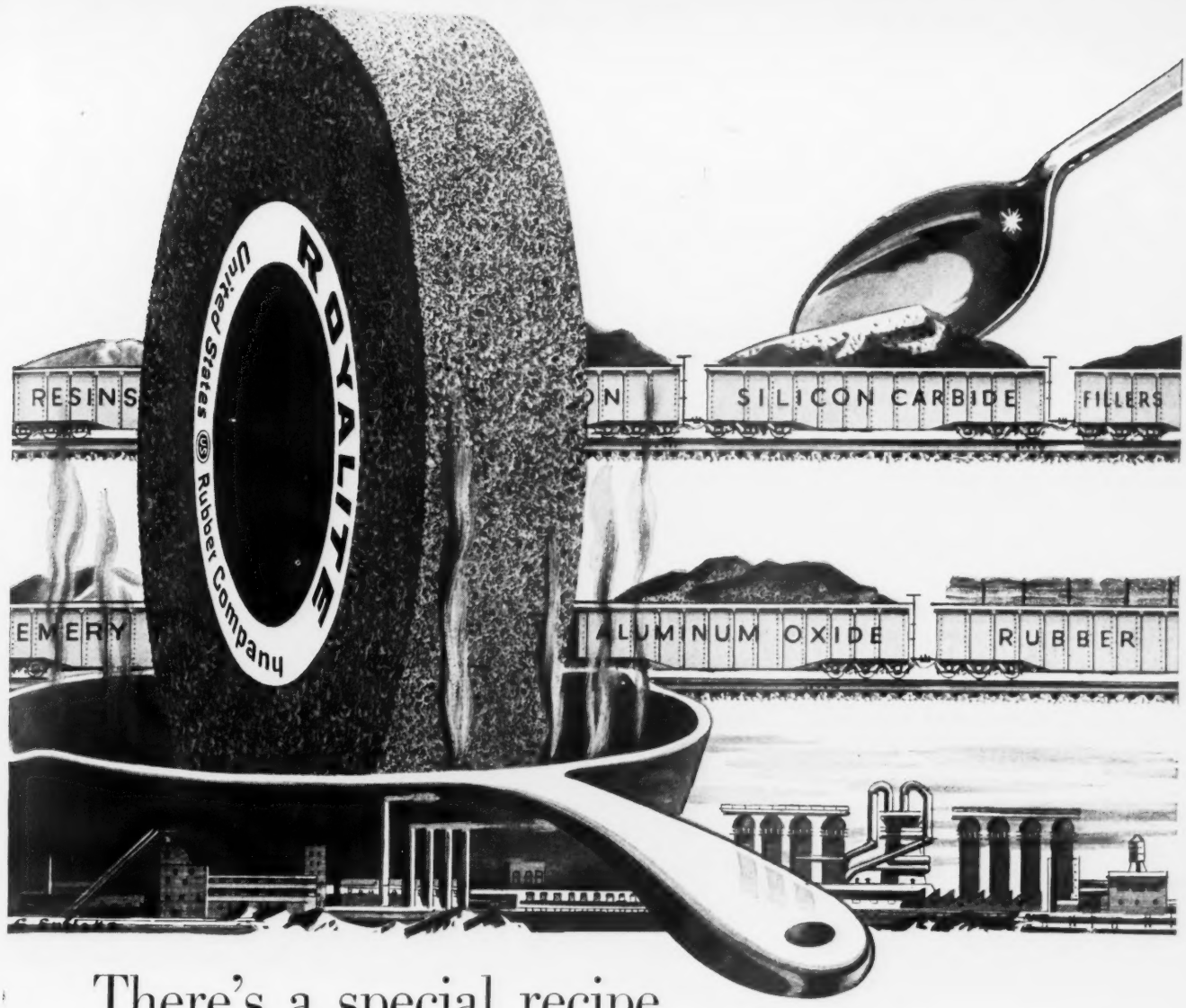

There's a special recipe for every "U. S." Grinding Wheel

Mixing up the right recipe for grinding wheels is a job for specialists. At United States Rubber Company, sales, development and product engineers are responsible for your getting the right wheel for your requirements. They know the best combination of resinoid or rubber bonds and abrasives to do your particular job in the most economical way. They study your requirements closely, they make field tests.

Such painstaking care and attention to detail are main reasons why industry depends on "U. S." Grinding Wheels. Whatever the job, whether it's snagging castings or grinding ball races, billets, bits, slabs, or smoothing welds, there's a "U. S." Wheel that's *precisely* right for the job.

Ask the "U. S." sales engineer to go over your grinding wheel problem. It will pay you. Write to address below.

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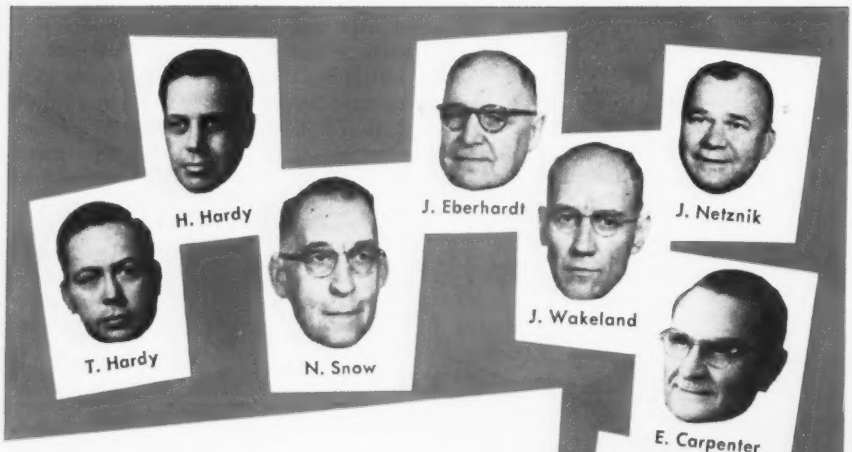
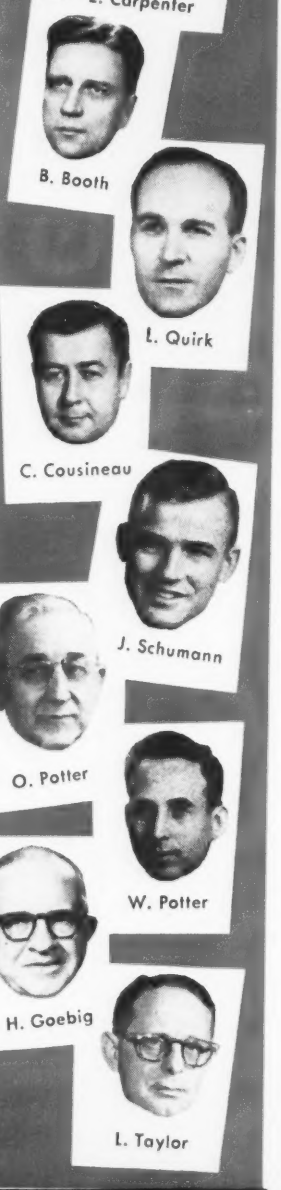


All of us want to meet YOU!



Booth 801, North Hall will be the Hardy Sand Company's headquarters at the 58th Annual Foundry Convention at Cleveland, May 8th to May 14th. All of us will be there to meet you, to answer your questions about Hardy Foundry Sand, Mold-Rite, Refract-O-Mold Spray, Big Horn Bentonite, and to show you the interesting exhibit we have prepared.

If you can't be at the convention we'd like for you to know that each order of Hardy Sand is laboratory controlled through it's production to meet requirements for grain, distribution, permeability, clay content, strength and moisture. We invite your inquiries.

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Wisconsin, Minnesota, Western Michigan —Carpenter Bros., Inc., Milwaukee.
Chicago—Goebig Mineral Supply Co.
California—Grant & Co., Los Angeles
Western Canada—Shananan's, Ltd., Vancouver, B.C.

All other states handled direct from Evansville, Indiana.

Producing controlled foundry sands for almost fifty years.

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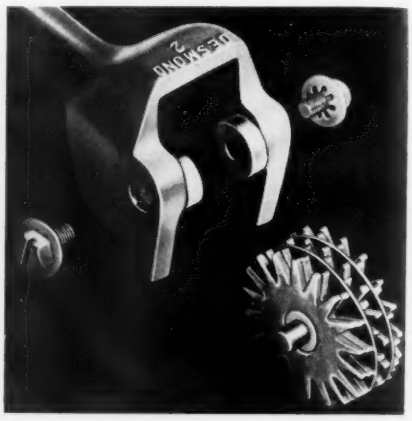
(*Continued from page* 408)

are inserted; then the negative is reinserted through another slot with a sheet of positive paper. Exposure, development and printing are performed without special lighting, darkroom or extra accessories and without noise or odor. Copies may be any length and up to 14 in. wide.

For More Details Circle No. 30—Page 397

Wheel Dressers: Desmond-Stephan Mfg. Co., Urbana, O.—Line of grinding wheel dressers features side



washer construction and quick cutter change. Heavy, hardened-steel side washers pressed into the handle casting protect the handle from wear by the revolving cutters. Hex head screws fitted with nonremovable lock washers securely lock the side washers in place and retain the cutter pin. Either a wrench or a screwdriver can be used to remove only one screw for quick cutter change. Hole in the end of the dresser handle is provided for fastening dresser to grinder. Unit is made in sizes No. 1, 2, 21 and 22, to hold cutters of those sizes.

For More Details Circle No. 31—Page 397

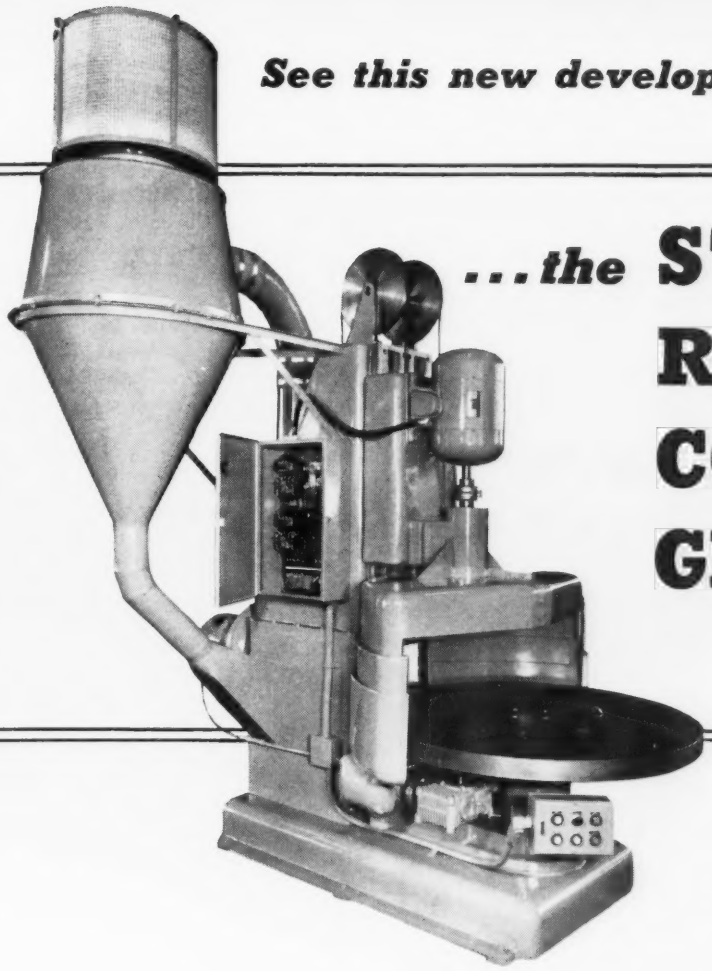
Industrial Batteries: Battery Division, Chicago Forging & Mfg. Co., 1317-25 West North Ave., Chicago—Industrial batteries for lift trucks and other heavy duty uses are available in 12½ and 16-in. plate models. Features include full length plates; separators that end shedding and electrolyte splash; grids with fewer and heavier members that have long resistance to electrolytic corrosion; and cushion design that permits them to function even with a crack in the case or when installed upside down.

For More Details Circle No. 32—Page 397

Belt Sander: Von Jonker Corp., Box 5656, Indianapolis, Ind.—Multishape belt sander uses only one rotating drum. Opposite end of the belt slides over changeable, small radius, shaped tips. With belts up to

(*Continued on page* 412)

See this new development in Core Grinders



...the STANDARD ROTARY CORE GRINDER

Here is the complete answer to your problem of dust-arresting and sand removal resulting from core grinding.

The grinding wheel and the rotating table below it are almost completely enclosed within a telescoping shroud which confines the free-flying sand and deflects it directly into a container in the special base. In addition, there is a funnel-like opening through the machine which pulls the sand and dust up into a separate dust collector.

The core grinder can be supplied with the collector as a built-in accessory or as an independent unit to be connected to your existing dust-arresting system.

The Model 48 illustrated here, to be shown for the first time in the Foundry show, has a 48″ table. Model 70 has a 70″ table. The table turns at 5 rpm but can be set at any given speed through change of pinion gear.

The Standard Rotary Core Grinders are designed for high production, with maximum accuracy, flexibility, and assure low operating costs.

Their sturdy construction makes them free of maintenance. The machines and grinding wheels of other models now in operation for the past three years in large foundries have required no service calls.

If you fail to see it at the Foundry show, ask us to send you detailed information. You'll certainly want to know all about this outstanding development for the benefits it can bring you.

STANDARD PATTERN WORKS

Machine Division

6771 E. McNICHOLS ROAD ● DETROIT 12, MICHIGAN

(*Continued from page* 410)

10 in. wide, the unit is driven through a 1 to 3-hp motor and a V-belt drive. Sealed ball bearings are used throughout. Multiposition design permits the chassis to rotate in a 90-degree arc. Use of V-belt pulleys permits three-speed operation. Adjustable end and side work table are available.

For More Details Circle No. 33—Page 397

Spacer Sleeve: Rollway Bearing Co., Syracuse, N. Y.—Inner spacer sleeve of the company's precision thrust roller bearing has been modified by exchanging the steel inner spacer sleeve, equipped with bronze inserts, for a one-piece high tensile sleeve of gray iron. Before the inner spacer sleeve was changed, the function of the bronze inserts was to give the revolving thrust plates a suitable operating surface. According to the company's engineers, two physical advantages of cast iron caused them to make this change. Cast iron has a uniform coefficient of expansion, and its use eliminates possibility of the bronze insert's loosening while in service because it expands more quickly than does steel when both metals are heated. Also, the engineers claim, cast iron is an excellent bearing medium in that it wears well and machines easily.

For More Details Circle No. 34—Page 397

Open-Mesh Abrasive: Carborundum Co., Niagara Falls, N. Y.—Open-mesh abrasive material for sanding operations where loading or glazing is a problem is available in a variety of shapes and sizes. The screen-like abrasive is coated uniformly with silicon carbide grain. The open-mesh construction permits sanding residue to flow through the numerous openings and enables the material to be used on both sides. Screen can be used wet or dry for both machine and hand sanding operations. It comes in full sheets, cut sheets and disks, in grit sizes of 180 and finer. Also can be furnished in 50 yd rolls up to 18 in. wide.

For More Details Circle No. 35—Page 397

Induction Motor: Westinghouse Electric Corp., 401 Liberty Ave., Box 2278, Pittsburgh 30—Company's new induction motor offers longer motor life, greater flexibility in application, higher reliability and decreased size in comparison with its predecessors. Ventilation, insulation and quiet operation have been improved. Conforming to new NEMA standard dimensions, it is smaller physically per horsepower. Electrical losses have been reduced by as much as 20 per cent for a given flux density. Frames are of cast iron. A four-way seal protects the bearing, with an inner and an outer seal on each side. The unit is available in three enclosures—totally enclosed fan cooled, totally enclosed nonventilated and drip-proof.

For More Details Circle No. 36—Page 397

Detachable Cabs: Campbell Detachable Cab Co., Wauconda, Ill.—Operator cabs for all models of Hough tractor-shovels and tractors and for

(*Continued on page* 414)

STANDARD'S *single wheel snagging grinders*

One of the 46 Single Wheel Infinitely Variable Speed Snagging Grinders now at work at Ford's ultra-modern Cleveland Foundry.

Here are the results that Standard type 33V Grinders deliver every day, every time:

- Higher Production
- Faster Metal Removal
- Longer Wheel Life
- Maximum Economy
- Minimum Maintenance

This grinder maintains 9500 S.F.P.M. all the way down to the flanges. By merely turning hand wheel, guard is adjusted and spindle speed is increased simultaneously in relation to worn wheel. No wrenches or tools are needed for this adjustment.
Available in both single and twin wheel construction.

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You Can Cut Your Foundry Costs in the *Birmingham* District

Center of the Growing Southern Market

Foundry Productive Capacity
10 Leading Market Areas

Principal City	Annual Capacity Net Tons
Detroit	2,419,332
Chicago	2,094,648
BIRMINGHAM	1,935,336
Pittsburgh	1,899,804
Cleveland	1,670,196
Indianapolis	1,173,360
Milwaukee	1,067,820
Los Angeles	870,588
South Bend	541,440
Buffalo	498,084

Source: FOUNDRY — August, 1953

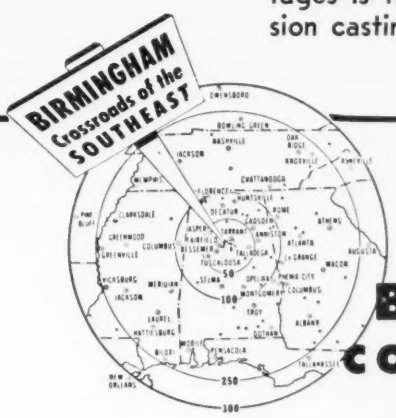
Increasing competition in practically every field is necessitating re-examination of production costs.

In the central Birmingham district—America's Number 3 market area in foundry capacity—there is an outstanding present opportunity for large and small foundries making all kinds of castings to cut costs and build sales volume.

HERE FOUNDRIES WILL FIND:

- ✓ **High and low phosphorus pig iron.**
- ✓ **Abundant supply of world's finest foundry coke.**
- ✓ **Natural and by-product gas and cheap electricity.**
- ✓ **Good moulding sand.**
- ✓ **Skilled, co-operative, native-born workers — many from families who have worked in foundries for two or even three generations.**
- ✓ **Fast growing Southern markets, where many millions are being invested in new plants.**
- ✓ **Superior transportation facilities — rail, truck and water — and favorable freight rates.**

This unusual combination of manufacturing and distributing advantages is the major reason why foundries making rough and precision castings are prospering in Birmingham.



Write this Committee or any of its undersigned members for detailed data on how to cut your foundry costs in this central district of the South.

BIRMINGHAM
COMMITTEE OF 100
1914 Sixth Ave., N., Birmingham, Ala.

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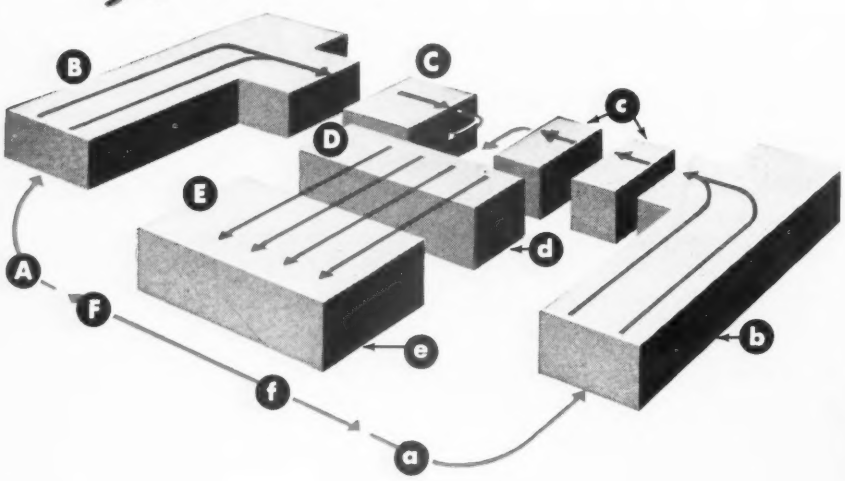
Heat Treat Furnace Layout

by Holcroft ...6th of a Series



A. Load
B. 2-row continuous atmosphere carburizing furnace
C. Oil quench
D. 4-row washing machine
E. 4-row draw furnace
F. Unload

a. Load
b. 2-row continuous atmosphere carburizing furnace
c. Salt bath quench and air blast cooling station
d. 4-row washing machine
e. 4-row draw furnace
f. Unload

How to Beat Heat Treat Costs!

Here's a furnace layout which is tricky—yet functional; one which steps up production—yet is flexible enough for different cycles!

Holcroft designed it to handle a variety of transmission parts requiring different processing cycles. In one case, parts are carburized, oil quenched, washed, and drawn. In the other, the stock is carburized, quenched in a salt bath, cooled with an air blast, washed, and drawn. The wash machine and draw furnace, though common to both cycles, are electrically independent.

While production flows at a rapid pace, the battery is so automatic that only a two-man crew is required for loading and unloading—one man on each side!

This is the type of furnace engineering that pays off in lower heat treat costs *to you!* And it's available on simple single-furnace jobs, or complex multi-furnace installations. It will pay you to write for more information—today! Holcroft & Company, 6545 Epworth, Detroit 10, Michigan.

BUILT BY HOLCROFT & COMPANY DETROIT MICH — **PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE**

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CANADA
Walker Metal Products, Ltd.
Windsor, Ontario

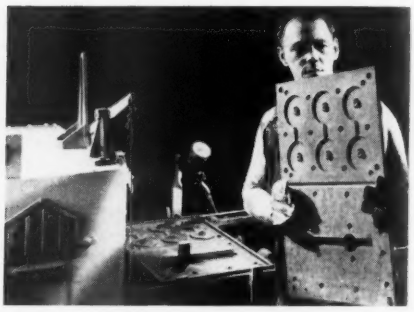
EUROPE
S. O. F. I. M.
Paris 8, France

(*Continued from page* 412)

most other standard makes of crawler and wheel-type tractors are easily detachable and feature strong, lightweight construction with safety glass all-around for maximum visibility and safety. Glass is cushioned and sealed in locking rubber channels. Ample room is allowed for the operator, and sliding side windows permit full ventilation when it is desired. Cabs tilt up and sideward in order to make operator entrance and exit easy and convenient. Windshield wipers can be furnished front and rear. Heater-defroster units also are available.

For More Details Circle No. 37—Page 397

Shell Mold Machine: Fairbairn Lawson Combe Barbour Ltd., Leeds, England — A one-man, two-station production shell molding machine for



making sand-resin molds is available for delivery in this country. The duplex machine has a pattern plate of 16 x 24 x ⅝-in. with an effective pattern plate area of 15 x 23 in. The framework carries two molding units, each comprising a gas-fired oven for preheating and curing and an ejection station with a central dump box servicing both molding units. Each oven has a temperature indicator. Spray guns, blowing nozzles and air transformer with internal piping suitable for connection to compressed air supply also are features of the machine. Technical details about sands, resins, curing times and finishes are available.

For More Details Circle No. 38—Page 397

Height Gages: George Scherr Co., 200 Lafayette St., New York 12—Height gage with a base slotted in front to allow the short solid jaw with straight scribing point to reach down to the surface plate permits marking and reading to start from the bottom with the vernier scale set to zero. A vernier 2.450 in. long, divided into 50 lines, extends over 49 graduations of 0.050 each on the main scale, making the difference in division of the vernier and main scale large enough to permit reading 1/1000 in. with the naked eye. An open slide permits a view of the entire scale, resulting in faster, more

(*Continued on page* 416)

MR. FOUNDRYMAN

We cordially invite you to visit our exhibit in space 1403 during the Foundrymen's Convention in the Public Auditorium at Cleveland, Ohio, and inspect the New Improved Moulders' Friend sand conditioners on display.

THE MOULDERS' FRIEND
DALLAS CITY, ILLINOIS

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OFFERED TO YOU!

Electro

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SINCE 1919

ELECTRO

RESIN & VITRIFIED

GRINDING WHEELS

By Job-Side Surveys, "Electro" has come up with many good answers which otherwise might take a long time to find out. • An "Electro" job-side survey at your plant may quickly better your grinding operation. Such a survey is made without charge or obligation.

LET US KNOW IF YOU WANT IT

Electro Refractories & Abrasives Corporation, 344 Delaware Avenue, Buffalo 2, N. Y. Information on any "Electro" products gladly sent on request: Grinding Wheels • Crucibles • Refractories • Electrocarb Grain • Briquets. PLANTS: Buffalo, N. Y. and Cap-de-La-Madeleine, P. Q., Canada • Regional Warehouse: Los Angeles 58, California • Grant S. Diamond, President.

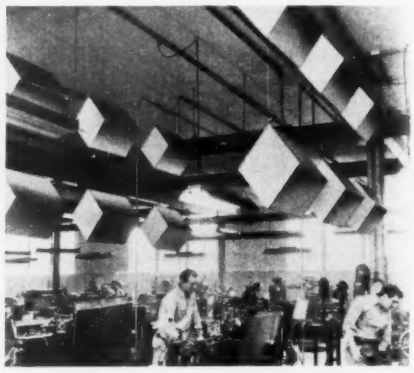
Electro Refractories & Abrasives

(*Continued from page* 414)

accurate reading. Stock sizes are of 10, 20 and 40 in. measuring capacity. A universal test indicator can be attached readily for reading in tenths or 0.0005 in.

For More Details Circle No. 39—Page 397

Sound Absorption: Sonosorber Corp., 21 South Sixteenth St., East Orange, N. J.—Portable sound absorbing units about 24 in. long are hung on 2, 4, 6 or 8-ft centers or as



desired, in clusters, honeycomb patterns or in layers of groups over and near the source of sound. Inner cores are encased in perforated stucco embossed aluminum. Units weigh about 2½ lb each. They are claimed to have high noise absorption value in both high and low frequencies. No alteration or moving of sprinklers, lighting fixtures or other equipment is required, and the units are not inflammable. Shipped knocked down, 25 units to a carton, they can be easily assembled and installed.

For More Details Circle No. 40—Page 397

Overlay Material: Eutectic Welding Alloys Corp., 40-40 172nd St., Flushing, New York, N. Y.—Manufacturer claims that this product, available in both powder and paste form, can be painted on a metal surface and will bond to the metal as a "skin-thick" film of hard, wear-resistant overlay up to 65 Rockwell C after the application of torch or carbon arc to melt the paste. Appliable to increase life on either old or new parts, it can be used in successive applications to create a thicker film for greater wear resistance.

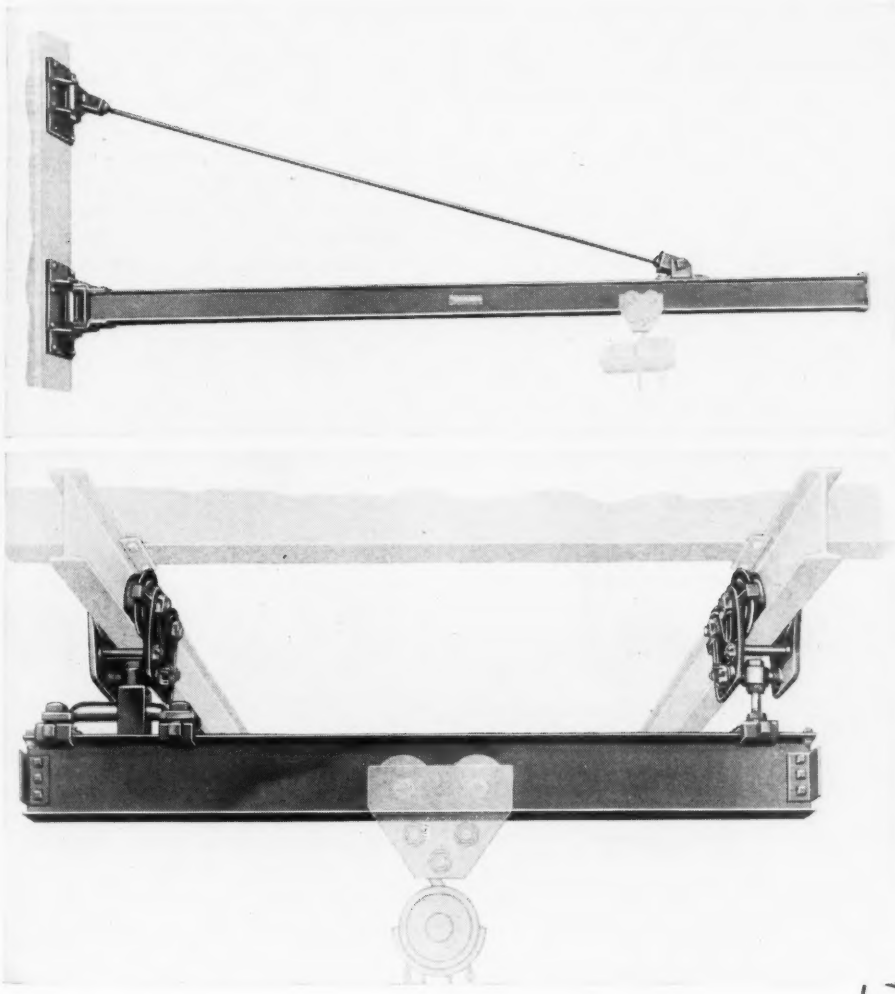
For More Details Circle No. 41—Page 397

Disc Sanders: Skil Corp., 5033 Elston Ave., Chicago 30—Two 7-in. disc sanders, one for standard duty and one for heavy duty, feature front handle location to take weight off the user's hands; short length and low weight to minimize worker fatigue; low maintenance cost and a speed of 4500 rpm. Standard equip-

(*Continued on page* 418)

Small foundries choose

Richards-Wilcox Cranes



#939 Swinging Jib Crane

Simplicity of design makes this crane inexpensive and economical to install. Most commonly used with the rod support (above) but is also available with curved track for supporting outer end of boom. Available in a variety of sizes with capacities up to 4000 lbs.

#971 Flexible Traveling Crane

Simple in construction but extremely flexible in operation. Yoke and cross-head (shown at left end of crane bridge) are self-adjusting to variations in track width, permit economical installation because accurately straight I-beam runways are not required. Crane cannot bind because bridge need not maintain right angle to tracks. Not suitable as a transfer crane. Available in many sizes with capacities up to 8000 lbs.

You don't have to be BIG to be efficient! Richards-Wilcox Cranes, No. 939 and No. 971 are designed to give better, lower cost performance in small foundries. Simplicity of design makes them inexpensive, easy and economical to install, while maintaining the highest standards of quality. R-W Cranes are typical of the many *quality* products made by Richards-Wilcox to help bring greater efficiency and lower costs to small space production.

Quality engineered for better performance

1880 RICHARDS WILCOX R-W AURORA TRADE MARK Reg. U. S. Pat. Off. 1954

SLIDING DOOR HANGERS & TRACK • FIRE DOORS & FIXTURES • GARAGE DOORS & EQUIPMENT • INDUSTRIAL CONVEYORS & CRANES • SCHOOL WARDROBES & PARTITIONS •

Richards-Wilcox Mfg. Co.

"A HANGER FOR ANY DOOR THAT SLIDES"

Branches in Principal Cities

320 W. THIRD STREET, AURORA, ILLINOIS

(*Continued from page* 416)
ment furnished with each includes a 7-in. molded rubber backing pad, backing pad nut, flange for grinding wheel, three assorted sanding discs, detachable front handle for right or left hand use, tool rest, wrench and a three-wire cord and connector.
For More Details Circle No. 42—Page 397

Gas Burner: North American Mfg. Co., 4455 East 71st St., Cleveland 5—Gas burner for use on pull-through air heaters operates under conditions of suction or negative draft. Offered as a package unit, it consists of a flame retention burner complete with mounting plate, refractory tile and adjustable shutter for controlling secondary air. Burner has a low-pressure gas pilot with spark ignition and provision for mounting a flame monitoring device. Package also includes an inspirator which enables the gas to entrain combustion air; a limiting orifice gas valve for setting the proper air-gas ratio; and a full flow gas cock for shutting off the burner. Five sizes are offered.
For More Details Circle No. 43—Page 397

MABCO

Presents

A Full Line of Quality Products for Your Foundry!

Liberty Liquid Parting
Core Oils
Core Oil Accelerator
Release Agent "G"
Aluminum Pattern Paint
Aluminum Plastic
Kuik Kore Kompound

and

Everything for the Modern Foundry

M. A. BELL COMPANY
217 Lombard St. · St. Louis, Mo.
"Serving the foundry industry for over 25 years"
HOUSTON DENVER

Safety Equipment: Chicago Eye Shield Co., 2300 West Warren Blvd., Chicago—Mounting device is the basis for making combinations of a head gear and helmet or plastic shield or wire screen shield or hard hat with the same protective equipment. It consists of wedge-shaped brackets which slide together and lock securely and may be unlocked quickly. A tilting mechanism allows the user to raise or lower the helmet or shield without difficulty, and an easily adjusted tension spring compensates for the difference in weight of the different pieces. Six combinations which formerly required 12 items can be made with five pieces of the company's equipment—a head gear, hard hat, welding helmet, plastic shield and a screen shield.
For More Details Circle No. 44—Page 397

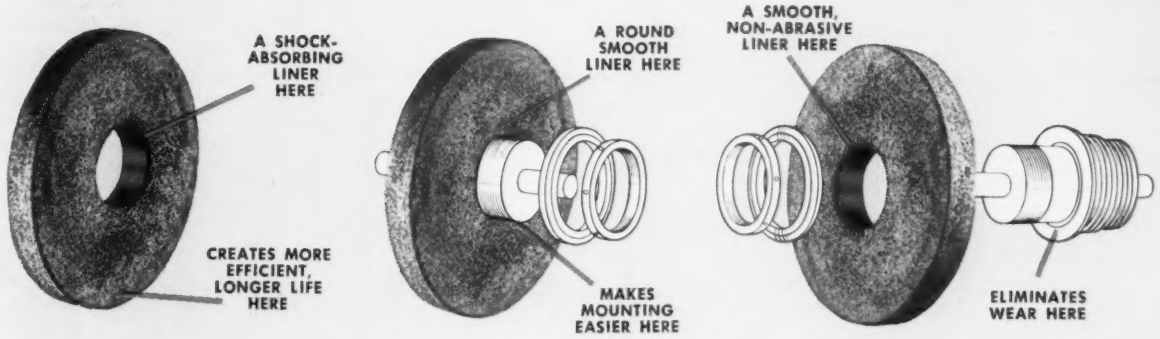
Plastic Metal: Chemical Development Corp., Danvers, Mass.—Puttylike material consisting of fine

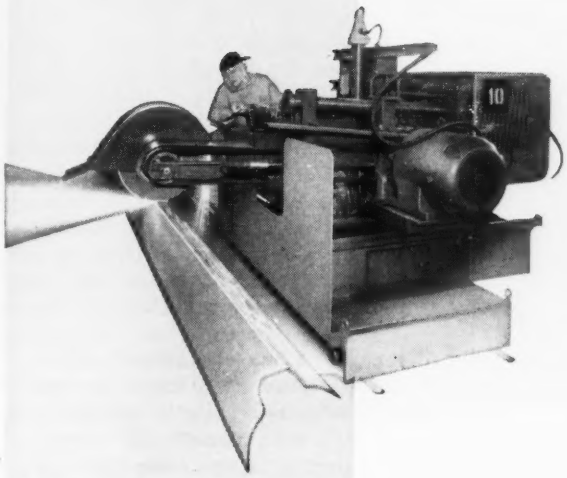
steel powders and a strong plastic can be used to caulk large holes in metal castings, to make permanent drill jigs, fixtures, forming dies and other products relatively quickly and inexpensively. It is used like modeling clay, without heat or pressure, and becomes a metallic piece in about two hours after the desired shape has been formed. Once it has formed, the material can be drilled, tapped, threaded and ground. It contains no solvents, is light in weight and can be chrome, nickel or copper plated for additional hardness. Storage life is in excess of one year.
For More Details Circle No. 45—Page 397

Level Indicator: Hewitt-Robins Inc., Stamford, Conn. — Electronic signal device has been developed to automatically prevent accidental overfilling or emptying of storage units. The level indicator uses a radio signal to indicate and control the level of the stored material. The device consists of a small radio transmitter housed in a steel probe placed at the level where flow of material is to be controlled. When stored material rises and envelops the probe or falls and exposes it, a signal is broadcast
(*Continued on page* 420)

For rugged conditioning jobs you can't beat...

MID-WEST FIBER-CUSHIONED SNAGGING WHEELS

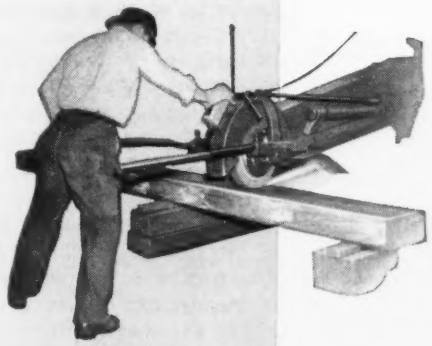

A SHOCK-ABSORBING LINER HERE
CREATES MORE EFFICIENT, LONGER LIFE HERE
A ROUND SMOOTH LINER HERE
MAKES MOUNTING EASIER HERE
A SMOOTH, NON-ABRASIVE LINER HERE
ELIMINATES WEAR HERE



Whether you use MID-WEST'S new automatic grinders, or hand-operated swing-frame grinders...

- **Mid-West snagging wheels are easier to mount!**
- **Their greater efficiency cuts grinding costs!**
- **And they're easier on your operator!**

Mid-West designed fiber-cushioned centers, plus Mid-West's special resinoid bond—an extremely tough, tenacious bond—assure increased production and lower grinding costs per ton! For complete information regarding fiber-cushioned snagging wheels—write, wire or phone today.



MID-WEST ABRASIVES

EXECUTIVE OFFICES: 510 SOUTH WASHINGTON ST., OWOSSO, MICH.
FACTORIES: OWOSSO, MICH. • ROCHESTER, PENNA.

(*Continued from page* 418)

to a remote control unit which sets off an alarm or actuates a mechanism which regulates the flow of materials. It is said the device will withstand the effects of vibration, extreme temperatures, dust, corrosion, moisture and voltage fluctuations.

For More Details Circle No. 46—Page 397

Storage Cabinets: Fidelity Products Co., Dept. 58, 2817 Third St., N. W., Canton 8, O.—Cabinets for storage for small items such as foundry pattern letters have solid metal frame and back with styrene drawers 1¼ x 2⅞ x 5¾-in. that divide into two or three compartments with the use of furnished divider strips. Fronts have slots to take furnished index labels. Cabinets sit on rubber feet or can be hung on a wall. They come in four sizes, with 16, 24, 32 or 48 drawers.

For More Details Circle No. 47—Page 397

Pressure Regulators: K-G Equipment Co., 1744 Lehigh St., Allentown, Pa.—Complete line of pressure regulators for use with most compressed gases includes single and two-stage models. Both types are claimed to afford excellent pressure regulation and low end points. Each includes models for use with oxygen, fuel gases and inert gases over a wide range of pressure and volume requirements. All models except the fuel gas regulators feature a 4000-lb high pressure gage. Fuel gas models are equipped with a 500-lb gage.

For More Details Circle No. 48—Page 397

Air Valve: Mechanical Air Controls Inc., 10030 Capital, Detroit 37—Sealed cover air valve with splashproof and dustproof gasket sealed cover is said to perform under conditions of excessive moisture and to

seal off effectively dust contaminants. Designed for operating air pressures up to 150 psi, the ⅜-in., four-way, solenoid operated valve is approved under Joint Industry Conference standards. Body assembly contains only one moving part and solenoid. Cover can be removed without disturbing valve body, solenoid or any piping or conduit connections. Only four screws need be unfastened. Valve also incorporates a self-lubricating feature. It is available in ⅜-in. unrestricted port size, single or double solenoid operated, with bottom ports and conduit connections. Standard side porting is available on request.

For More Details Circle No. 49—Page 397

Pipeline Regulator: Air Reduction Sales Co., 60 East 42nd St., New York 17—Series of inverse-type regulators featuring a seating arrangement which requires no nozzle has replaced the company's line of 8600 series regulators. The new regulators are engineered for use with gases supplied by pipeline systems using comparatively low pressures. Regardless of fluctuation in the line pressure, the regulators supposedly maintain a steady gas pressure thereby eliminating the need for frequent regulator adjustment.

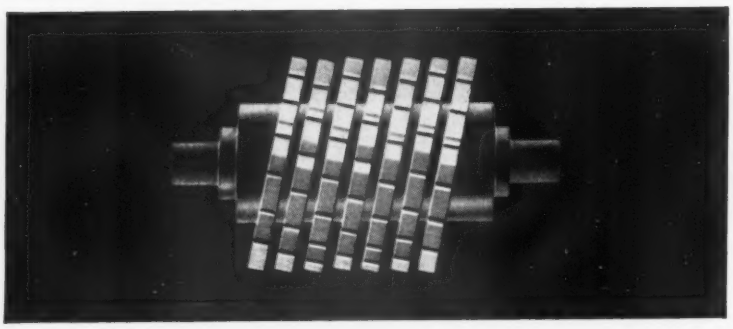
For More Details Circle No. 50—Page 397

Respirator: Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8—Respirator

(*Continued on page* 422)

new ANGLE

for heavy-duty dressing



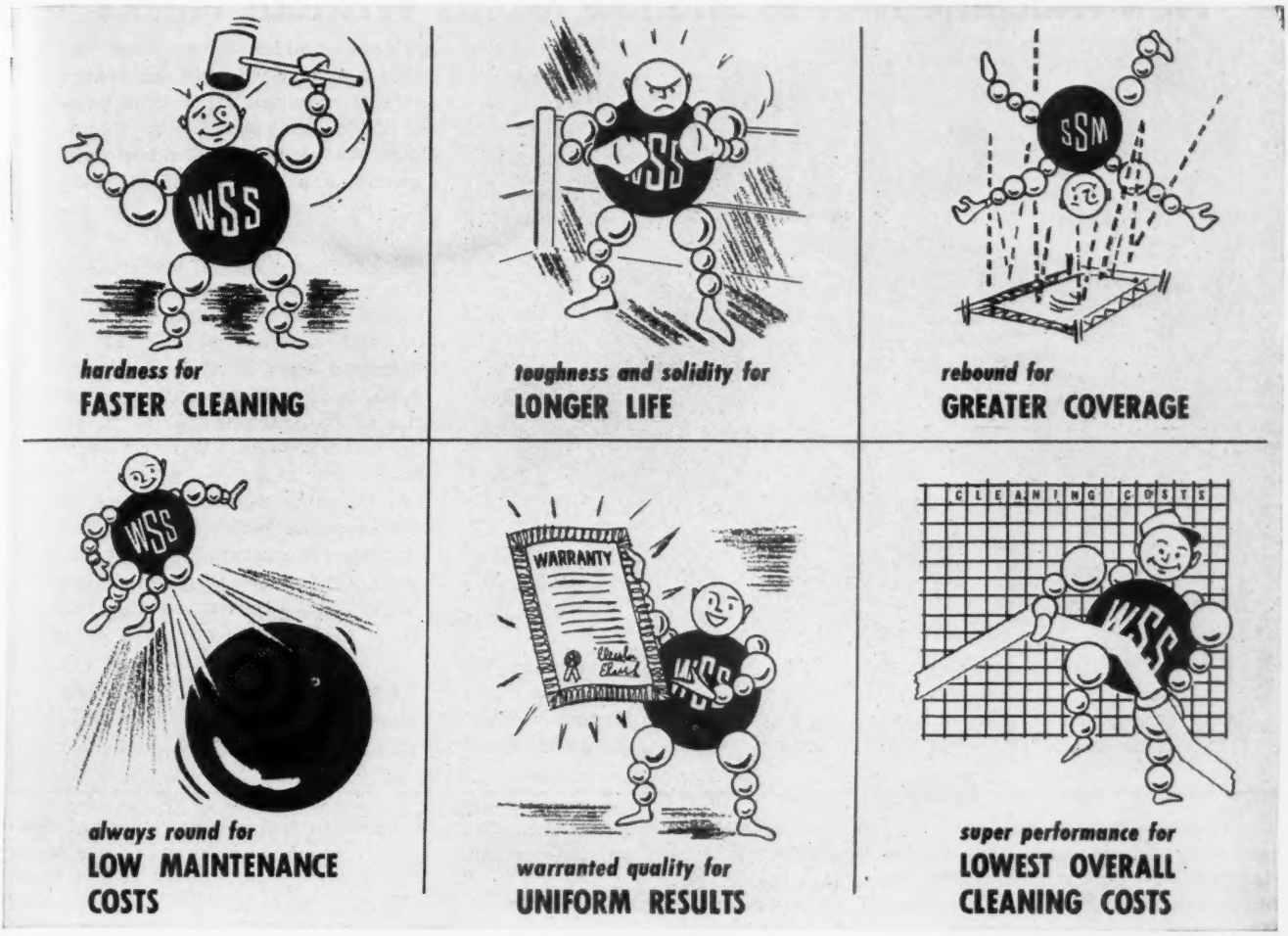
Desmond's Heavy Duty Dresser makes quick work of truing large, high speed rubber- or resinoid-bonded grinding wheels. Shears and picks at same time with patented angle-set Desmond-Huntington cutters. Dust-shielded ball bearings guarantee lasting precision. Cutters easily replaceable without adjusting bearings. Ask your Desmond distributor how proper dressing can make your grinding wheels serve better—longer.

THE ONLY COMPLETE LINE OF GRINDING WHEEL DRESSERS AND CUTTERS

Desmond

THE DESMOND-STEPHAN MFG. CO., URBANA, OHIO

pioneering developments keep **WHEELABRATOR® STEEL SHOT** *first in abrasives*



ONLY WHEELABRATOR® STEEL SHOT has all these advantages

These are the reasons why Wheelabrator Steel Shot, made from electric furnace steel, has set a new standard for blast cleaning efficiency. The hardness of this super shot (42 to 50 Rockwell C) concentrates the impact of each pellet on the work so that sand and scale are quickly removed. Its toughness and native impact strength considerably reduces shot consumption. All shot is round and solid — free from surface cracks.

Its unique rebound properties cause it to carom from part to part, penetrating and cleaning intricate cavities not reached by other abrasives. Rebounding on impact, it eliminates the problem of imbedment.

The roundness of Wheelabrator Steel Shot drastically reduces parts replacement and maintenance costs. Because it stays round throughout its life, excessive machine wear due to sharp edges is practically eliminated.

Uniformity of carbon content, hardness, microstructure and screen analysis, obtained through 19 production control checks, is assured by a written warranty. It gives you the same low-cost, highly effective cleaning performance every day of the week . . . every week of the year.

These extra values add up to a SUPER PERFORMANCE that means lower overall cleaning costs for you.

PLUS

50 lb. CARTONS AND PALLETIZING

For Safety—Convenience—And Lower Cost To You

PLUS

A SCHEDULED DELIVERY PLAN

that assures the size and quantity you need when you need it!

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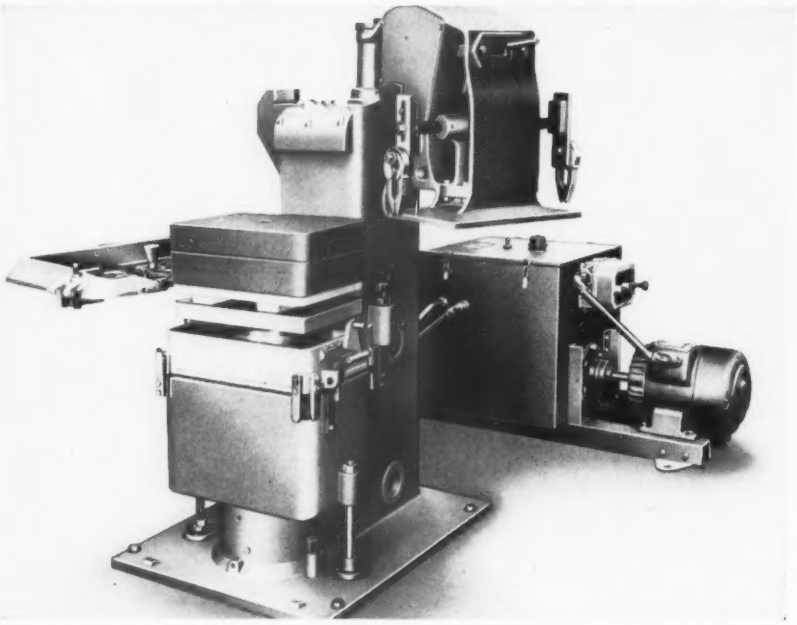
American
WHEELABRATOR & EQUIPMENT CORP.

Wheelabrator STEEL SHOT

505 S. Byrkit St., Mishawaka, Indiana

New Machine Makes Shallow Molds Without Flasks



LIGHTWEIGHT, shallow castings are molded without snap or slip flasks on a machine that rams copes and drags simultaneously. The machine incorporates permanent aluminum top and cast iron bottom "boxes" or mold forms. A double-faced pattern (matchplate) must be used. A supply of bottom boards only is required. Hydraulic power of 750 psi is provided by a compact, self-contained oil pump unit, producing a pressure of 5½ tons on the squeeze piston. The resulting pressure of 60 psi on the mold gives a high hardness figure. The main ram stroke can be adjusted between a minimum of 9 in. and a maximum of 12 in. Standard size of the mold produced is 12 x 17 in., with a variation of the machine making molds up to 14 x 18 in. With an overhead sand feed, one operator is said to turn out an average of 100 complete molds an hour. The machine is operated from a remote control pedestal which can be located adjacent to the machine itself. This unit is a product of the Sutter Products Co., 2005 Westwood Ave., Dearborn, Mich.

For More Details Circle No. 52—Page 397

(*Continued from page* 420)

employing static-web dust filters clamped on twin-chemical cartridge filters has been developed to protect the wearer against toxic dust as well as organic vapors. The dust filter is made of charged, resin-treated felt which is said to promote electrostatic retention of dusts and supplements mechanical filtering action. Cartridges and filters are independently replaceable.

For More Details Circle No. 51—Page 397

Oil Separators: Eclipse Fuel Engineering Co., Rockford, Ill. Simplex and duplex type oil separators for pressures up to 250 psi have been added to the company's line of heating equipment. The units are to be used in the circuits of closed flame gas-oil burners. Filters can be used for coarse straining or fine filtration. Perforated metal strainers are used in separating particles down to 1/64-in. For finer separation, either metal

(*Continued on page* 424)

Small Portable Grinder Is Lightweight But Powerful

LIGHTWEIGHT, rotor, air cone grinder weighs only 8½ lb and is designed to get into small openings where larger wheels cannot reach. One-piece spindle is supported by three bearings, with front bearing wider to give more bearing surface on spindle and lengthen life. All bearings are double shielded and mounted in steel inserts cast into magnesium. Either grip or straight handles are standard. Throttle handles can be changed to four different positions for operator's convenience. Speeds of 8500 rpm for cone and 4 in. wheels and 6000 rpm for 6 in. wheels are obtainable. The grinders are manufactured by Rotor Tool Co., 26300 Lakeland Blvd., Cleveland 23.

For More Details Circle No. 53—Page 397

AJAX-NORTHRUP
HIGH MELTING SPEED

saves more than just TIME

Time saved . . . more heats . . . increased production are obvious benefits of AJAX-NORTHRUP Hi-Speed Induction Melting. Perhaps not so obvious, however, are many additional savings . . . important whether you have one melt a day or twenty.

The AJAX-NORTHRUP Induction Furnace melts so fast that there is practically no chance for oxidation. Without electrodes or combustion gases, there is almost complete freedom from contamination of any kind. Metal losses are virtually eliminated. Savings in even the base metals are substantial. In the costly and more easily oxidized alloying metals, savings are so large as to seem unbelievable . . . but they are true. A foundry casting 18-8 type alloys reports 100% recovery of nickel; 99% chromium; 95% molybdenum and similarly large percentages of every alloying element. A typical non-ferrous foundry reports reduced melting costs of over $33.00 a ton.

These savings can be realized in *any foundry*, ferrous or non-ferrous, providing an excellent return on your original investment in AJAX-NORTHRUP equipment.

We would be pleased to show you actual cost data that other AJAX-NORTHRUP Furnace users have made available. Just write or telephone us.

541

AJAX NORTHRUP SINCE 1916

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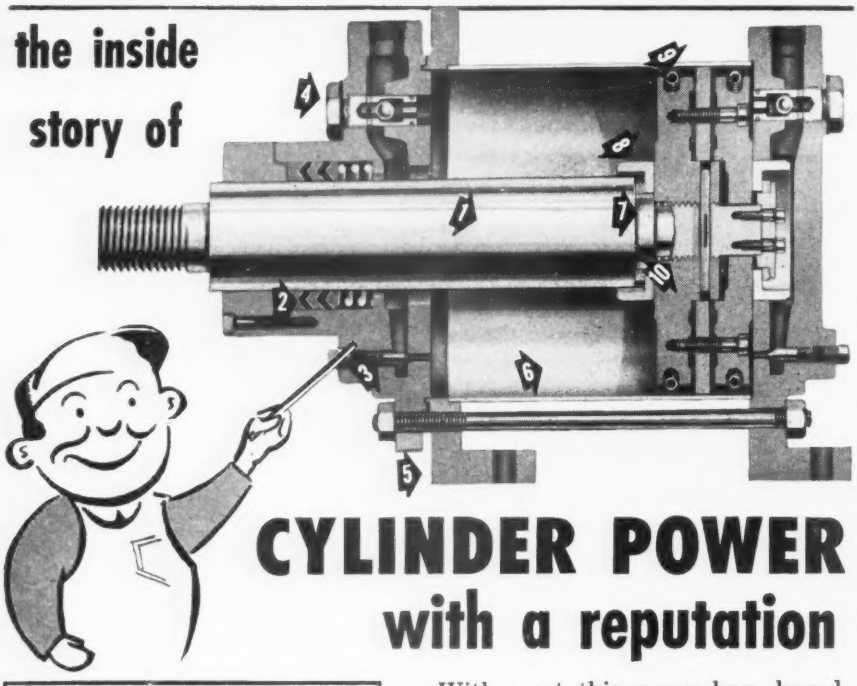
Associated Companies: Ajax Electrometallurgical Corp. • Ajax Electric Furnace Co. • Ajax Electric Company, Inc. • Ajax Engineering Corp.

the inside story of



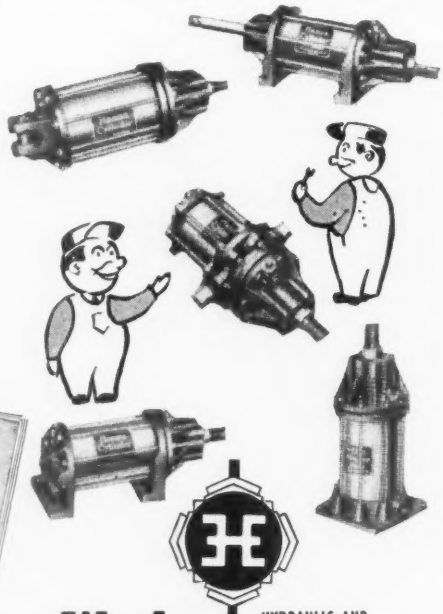
CYLINDER POWER with a reputation

10 HANNA FEATURES

1. Piston rod ground and polished to assure long packing life and smooth operation.
2. Spring-backed, chevron type packings permit solid fit of gland to front head. Self-adjusting.
3. Bleeder adjustment needle is stainless steel, shakeproofed to provide self-locking cushion adjustment.
4. Replaceable bronze check valve for quick starts under full power on return piston stroke.
5. Flange design permits removal of front head without disturbing cylinder mounting.
6. Brass cylinder tube is non-corrosive with smooth bore for longer packing life.
7. Cushion floater with cork washer facilitates cushion alignment with head.
8. Bronze cushion sleeves—non-corrosive, long wearing.
9. Expander springs insure uniform contact of packing with tube and eliminate collapse.
10. Piston "O" rings prevent air leakage past threaded piston fastening.

With most things you buy, brand name is important. When you buy air cylinders, it's downright vital. With cylinders, as with other products, name is built on reputation. Hanna's reputation springs from more than 50 years of research and pioneering in power motion. When you specify Hanna, you specify cylinder power with a reputation. The proof? You'll find 10 specific reasons for the superior performance of Hanna cylinders in the panel at the left.

Standard models for every application.



Send for Hanna Catalog 236

It contains complete details and specifications on Hanna Low Pressure Cylinders.

Hanna Engineering Works

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HYDRAULIC AND PNEUMATIC EQUIPMENT
CYLINDERS . . .
VALVES . . .
RIVETERS . . .

(*Continued from page* 422)

or fabric filters are used, depending upon degree of filtration required. Strainers and filters are interchangeable.

For More Details Circle No. 54—Page 397

Atmosphere Tester: Electric Furnace Co., Salem, O.—Portable, visual unit for testing gases enables operator to determine the quality of gas being produced by a special atmosphere generator or the quality of atmosphere in special atmosphere heat processing furnaces. To make a test, the operator clamps a strip of metal of similar composition to that

of the material being heat treated between two electrodes visible within a Pyrex tube, making the material a resistor in a circuit. The gas atmosphere to be tested then is supplied to the tube. Operator raises the temperature of the specimen, which is controlled by a rheostat, to that of the material in the furnace, holds the sample at temperature for the desired length of time, then drops the atmosphere to the critical temperature at which the material would discolor in the gas atmosphere being tested. This procedure establishes the length of time the material must pass through the critical range to prevent discoloration. Carbon potential of an atmosphere is determined similarly.

For More Details Circle No. 55—Page 397

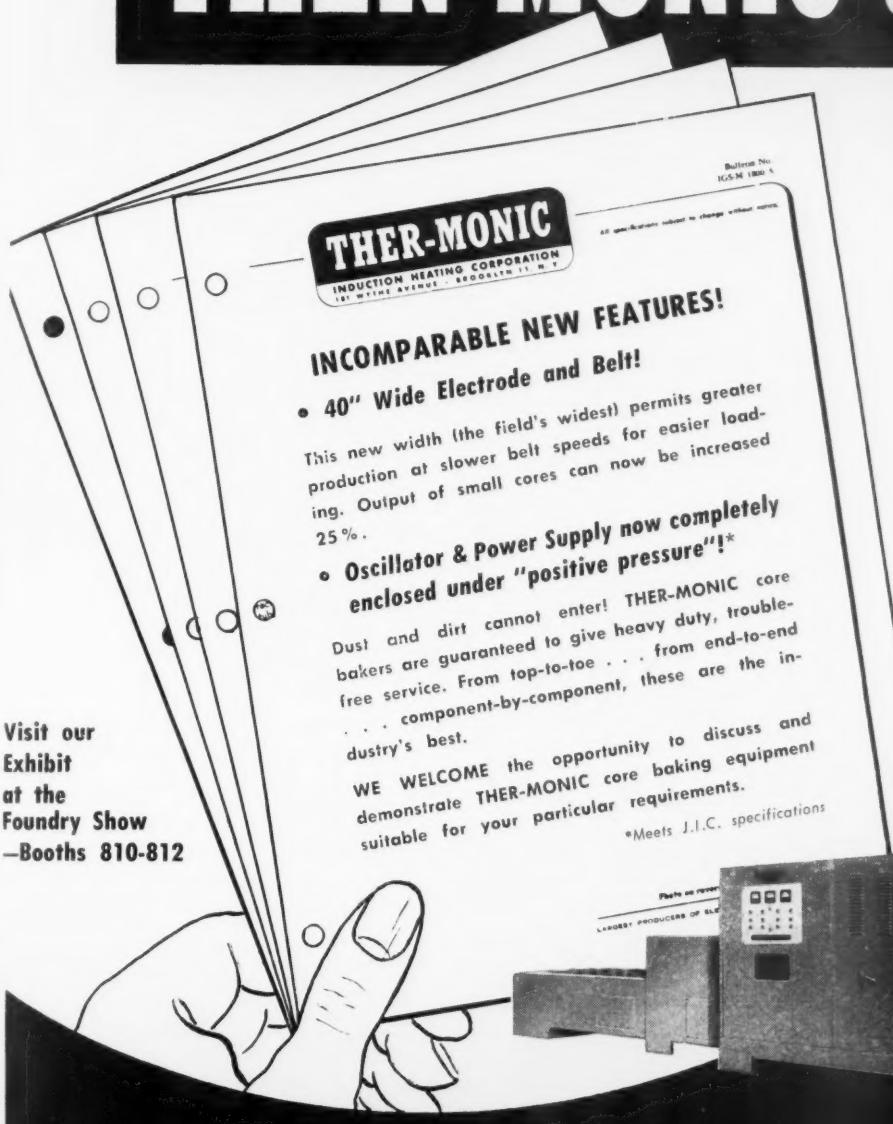
Clamp Vise: Evanson Equipment Co., 33 Warren St., Newark 2, N. J.—Quick action vise designed to speed production in both manufacture and repair locks tightly in two seconds. Vise is light weight and can be held while working. Portable or attachable it may be used in any position, horizontally or vertically and can be used as a basic tool for holding assemblies and jigging and production line clamping.

For More Details Circle No. 56—Page 397

Rail Skids: L. B. Foster Co., 1721 Commerce Bldg., Houston 2, Tex.—High load capacity skid to simplify yard storage of heavy materials such as steel pipe, tubing, large flasks,

(*Continued on page* 426)

THER-MONIC ELECTRONIC CORE BAKERS


THER-MONIC
INDUCTION HEATING CORPORATION
181 WYTHE AVENUE · BROOKLYN 11, N. Y.
INCOMPARABLE NEW FEATURES!
• 40" Wide Electrode and Belt!
This new width (the field's widest) permits greater production at slower belt speeds for easier loading. Output of small cores can now be increased 25%.
• Oscillator & Power Supply now completely enclosed under "positive pressure"!*
Dust and dirt cannot enter! THER-MONIC core bakers are guaranteed to give heavy duty, trouble-free service. From top-to-toe . . . from end-to-end . . . component-by-component, these are the industry's best.
WE WELCOME the opportunity to discuss and demonstrate THER-MONIC core baking equipment suitable for your particular requirements.
*Meets J.I.C. specifications

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INCOMPARABLE PERFORMANCE RECORD!

The electronic core baking process . . . first introduced in 1945 by Induction Heating Corporation, largest producers of electronic heat treaters . . . has won, in a relatively short space of time, an important place for itself in the core rooms of the greatest number of those foundries which have already installed electronic core baking equipment.

Since the introduction of the first Ther-monic laboratory core baker . . . we have developed, in close collaboration with interested foundries, the type of rugged equipment best suited for the industry's particular needs. A recent survey of two thousand Ther-monic installations in all fields, revealed the amazing fact that our service division has only averaged one call in 1.6 years per unit.

Ther-monic core baking equipment is now available with hourly capacities of 500 lbs., 1000 lbs., 2000 lbs., 4000 lbs. and 8000 lbs. One of our field engineers will be glad to personally survey your core baking requirements. Write today!

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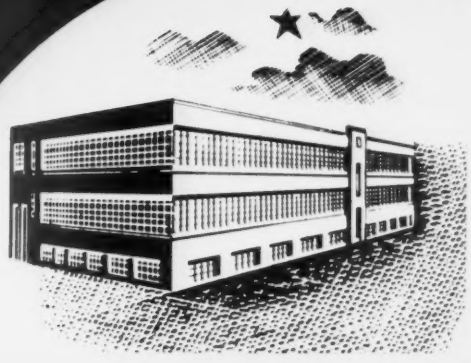
Yours for the asking . . .
Write for new, illustrated specification sheets. Study and compare the many exclusive features incorporated therein.



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Largest Producers of Electronic Heat Treating Equipment

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CARBON-BONDED SLAG HOLE BLOCKS

Longer Cupola Runs because Starrbide Carbon-bonded slag hole blocks stay in use longer than ordinary blocks.

Reduced Erosion
from heat, slag flow, and oxygen torch when lanced.

Improved Flow Control
because runs are longer, more easily scheduled.

Higher Thermal Conductivity
rapidly dissipates heat.

Greater Production
because shutdowns are reduced.

AMERICAN REFRACTORIES & CRUCIBLE CORP. NORTH HAVEN CONNECTICUT

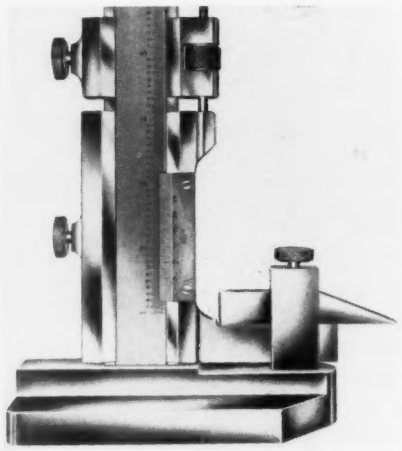
ALSO MAKERS OF FAMOUS STARRBIDE CARBON-BONDED CRUCIBLES, GRAPHITE CRUCIBLES AND SUPER REFRACTORIES.

(*Continued from page* 424)

heavy boxes and beams can be moved easily from place to place. The skid consists of railroad rail, cut to length, and precast concrete supports with anchor bolts cast in place. To assemble, the concrete supports are spaced at desired intervals and the rail is bolted to the supports and anchored with rail clips. A claimed advantage is that the unit is quickly disassembled and moved to suit requirements of the job.

For More Details Circle No. 57—Page 397

Height Gages: Foster Supplies Co., 6122 Milwaukee Ave., Chicago 30—Stainless steel height gages with chrome-plated graduations eliminate



glare and eye strain and are easy to read. Beam is completely hardened, and the large 1.225-in. vernier is of chrome-plated stainless steel. Vital parts are claimed to be impervious to finger acidity or rust. Long slide, large base and heavy beam reportedly insure great accuracy and dependable stability. Sizes available include 12, 14, 18, 24, 36, and 48 in.

For More Details Circle No. 58—Page 397

Tool Dressing: Lobdell United Co., Wilmington 99, Del.—Tool dressing unit contains, according to the manufacturer, all of the forging, heat treating and dressing equipment necessary to obtain the best life from cutting and chipping tools through proper dressing. The "package" includes forging hammer, forging furnace, pot furnace, quench tank, tempering furnace and tool grinder. It is claimed that use of the equipment will reduce tool inventory costs, and that no special metallurgical controls are required.

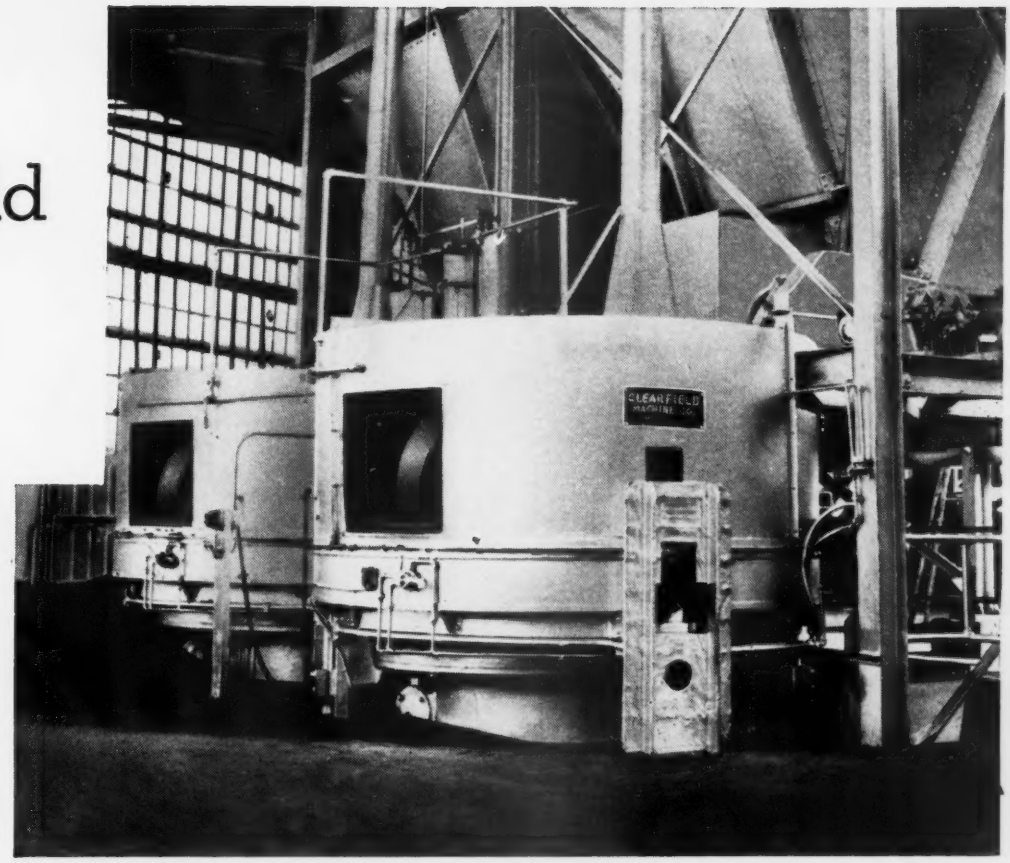
For More Details Circle No. 59—Page 397

Power Sweeper: Wilshire Power Sweeper Co., 526 West Chevy Chase Dr., Glendale 4, Calif.—Power sweeper is able to turn within its own length. With the operator seated at

(*Continued on page* 428)

the clearfield MIXER

"perfect in every respect"



A Clearfield Mixer installation which has provided outstanding performance.

THAT'S what one of the many enthusiastic Clearfield Mixer owners told us . . . "perfect in every respect." We're very happy that the performance of our equipment brings forth such remarks.

Clearfield Mixers, with their unique revolving pan principle and their fully automatic controls, take all the guesswork out of sand preparation. And they're available in a large range of sizes for use independently or as an integral part of a sand conditioning system. You can't go wrong with a Clearfield.

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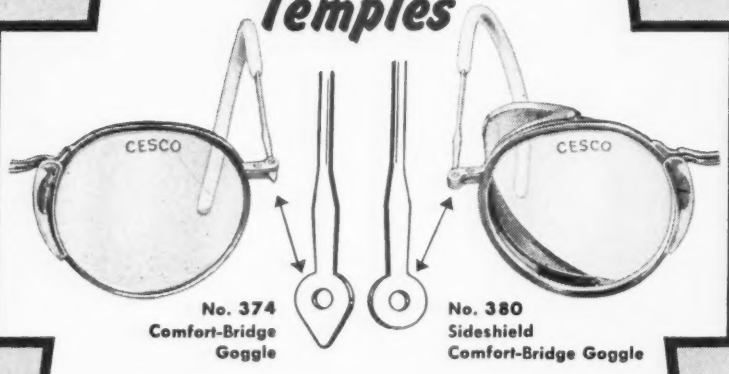
CLEARFIELD MACHINE COMPANY
CLEARFIELD PENNSYLVANIA, U. S. A

CESCO RIGHT... before your Eyes!

NEW Temples



No. 374 Comfort-Bridge Goggle

No. 380 Sideshield Comfort-Bridge Goggle

Now, CESCO Comfort-Bridge Goggles are furnished with new symmetrical tip temples which are interchangeable—right or left.

These new temples are better looking and designed with greater strength at the endpiece joint where breakage usually occurs. That's because the flat bar of the temple is at a right angle to the tip.

Insulators, made of attractive flesh-colored extruded plastic, are easy to replace. They slide freely over the flexible shaft ends and are automatically held in place. Closed end of the plastic insulator keeps shaft from poking through.

Added to the many other features of CESCO Comfort-Bridge Goggles, these new temples make the **No. 374** and **No. 380** CESCO Goggles the most acceptable of any safety glasses. Workers like to wear them. Service costs are lower because repairs are easier, and less frequent. And . . . they're *"RIGHT... before your Eyes."*

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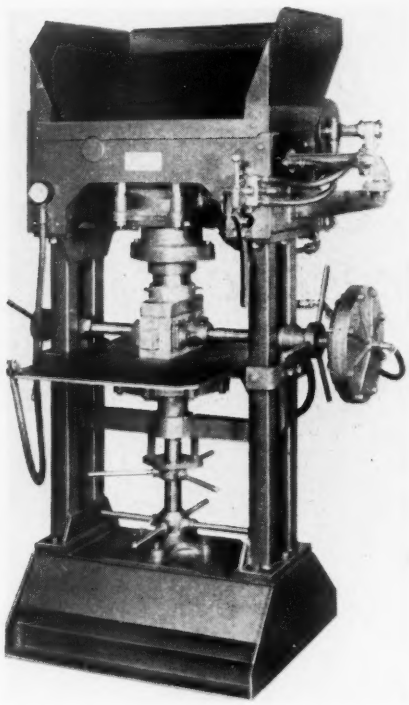
(*Continued from page* 426)

the front with an unobstructed view, the added manueverability enables him to sweep close to posts, walls, curbs, equipment and sharp corners, according to the manufacturer. Enlarged dust bag eliminates necessity for frequent emptying. Machines are available that will sweep 36 and 48-in. paths. Special dual side sweepers will increase the sweeping path to 70 in.

For More Details Circle No. 60—Page 397

Core Blower: Redford Iron & Equipment Co., 20733 Glendale Ave., Detroit 23—Power, capacity and speed

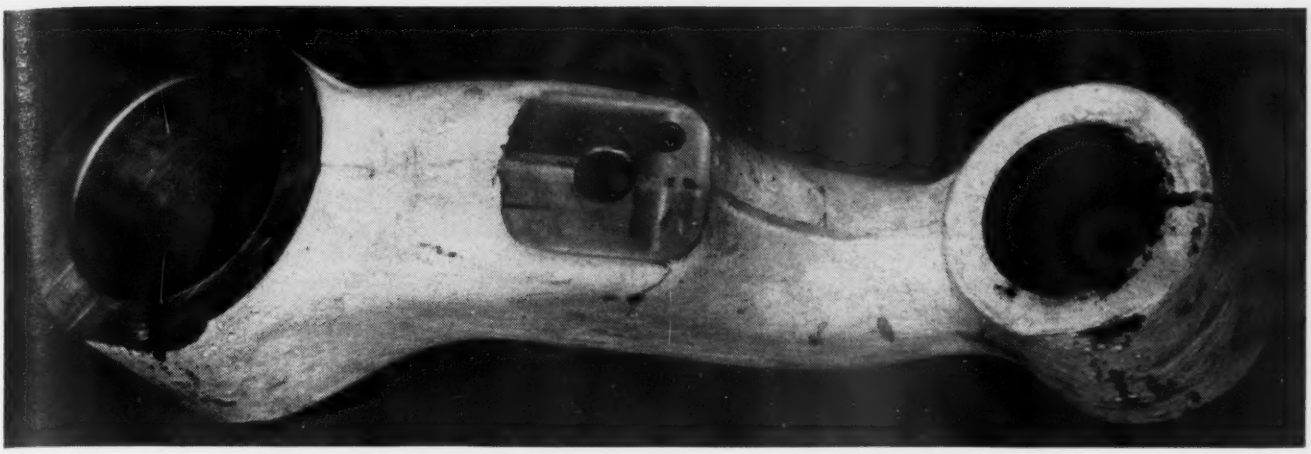


are reportedly designed into this core blower to fill a need for a fast and flexible machine to blow cores from a few ounces to 10 lb. Operating cycle permits immediate release of the core box after cores have been blown. Exhaust air is utilized to fluff the sand remaining in the sand magazine after each blow. Magazine heads are available as standard equipment. Vertically parted core box set up is simplified by use of an adjustable clamp. Production up to eight boxes per minute while using only one core box per machine is claimed.

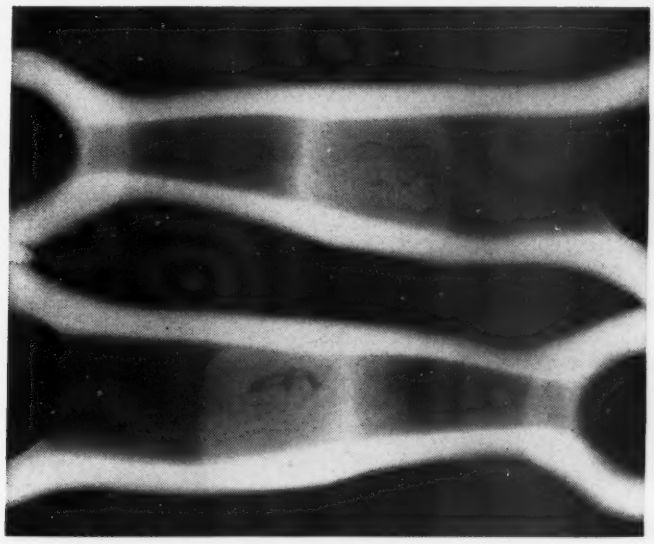
For More Details Circle No. 61—Page 397

Carbide Grinder: Standard Electrical Tool Co., 2507 River Rd., Cincinnati 4—Six-inch heavy-duty carbide tool grinder has been added to the company's line of grinding, polishing and buffing equipment. Grinder has a ¾-hp, 3600-rpm motor, available in either single-phase or three-phase current. Forward-off-reverse controls and adjustable steel

(*Continued on page* 430)



Ankle Bone for tons of tank—



RADIOGRAPHY proves it sound

It's the support for the track wheel of a tank —a tough job if there ever was one. Failure would mean complete disablement.

With soundness so vital, every casting was radiographed. It's the one way to prove that no hidden flaw exists without destroying the part.

Radiography forestalls releasing imperfect castings—helps build reputations for consistently good work. This is why it is more and more becoming a routine procedure in many foundries.

If you'd like to know how Radiography can improve your own operations, discuss it with your x-ray dealer. Also send for a free copy of "Radiography as a Foundry Tool."

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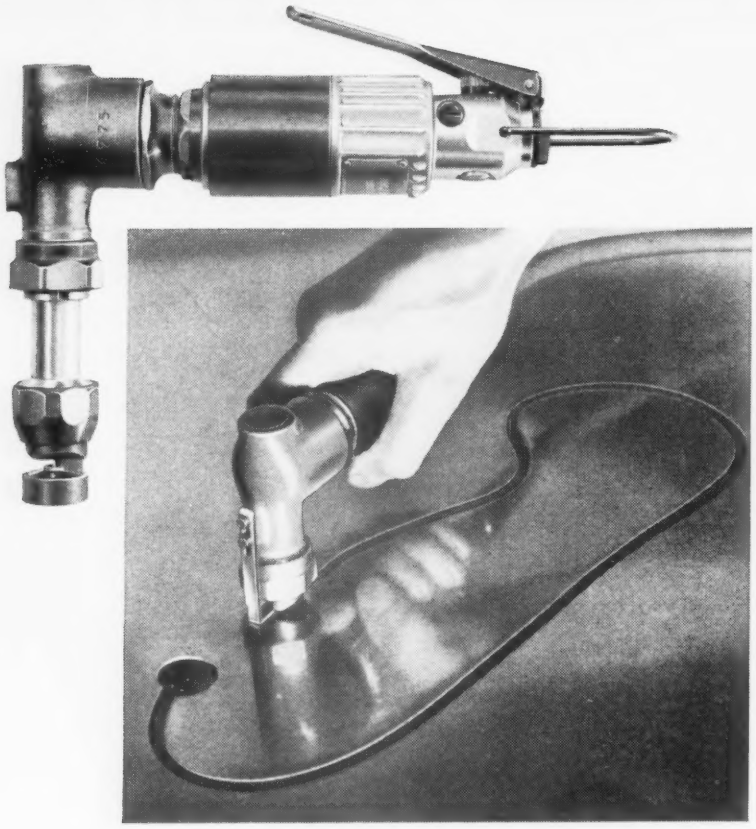
X-ray Division, Rochester 4, N. Y.

Radiography...
another important function of photography

Kodak

in portable nibblers

YOUR BEST BUY IS BUCKEYE



Buckeye portable air-powered nibblers eat their way through 18-gauge sheet metal, leaving a clean, sharp cut with no distortion of the exposed edges. They cut a radius as small as one inch, follow the most intricate contours swiftly and exactly. When working on panels already assembled in position, cutting can be started anywhere an access hole is provided for the nibbler. Extra-long throat model permits cutting in hard-to-reach areas.

All Buckeye nibblers have hardened and ground punch and anvil, easily accessible for re-grinding and replacement, if necessary. If you cut sheet metal up to 18-gauge, a Buckeye nibbler can become one of the busiest tools in your plant!

AIR TOOLS CATALOG

Write for your copy of our Air Tools Catalog. Trial test of any Buckeye tool, in your own plant, can be arranged without obligation.

Buckeye Tools CORPORATION
DIVISION 20 • DAYTON 1, OHIO

producers of the world's first successful rotary air tools

IN CANADA: Joy Manufacturing Co. (Canada) Ltd., Galt, Ontario

(*Continued from page* 428)

wheel guards are standard and heav work tables on each side, measurin 7 x 10 in. tilt 10 degrees above t 20 degrees below horizontal axis Either grinding wheels or diamon wheels can be used.

For More Details Circle No. 62—Page 397

Band Saw: Oliver Machinery Co 1001 Coldbrook St. N.E., Grand Rapids 2, Mich.—Company offers a spe cial band saw with capacity of 35

in. under the guide. The machine has 36-in.-diam wheels and is driven by a 5-hp motor built directly on the lower wheel shaft. Wheel speed is 720 rpm, giving a blade speed of 6780 fpm.

For More Details Circle No. 63—Page 397

Automatic Drive: Clark equipment Co., Industrial Truck Division, Battle Creek, Mich.—Company has developed a transmission which does away with a gear shift, high and low gears and a clutch and clutch pedal. The new drive, which combines a torque converter with a simple constant-mesh transmission, makes possible operation of the gas-powered fork truck with three simple controls, an accelerator, brake pedal and a forward-reverse selector lever. According to the company, the drive eliminates gear clashing during engagement, which reduces maintenance costs and results in smoother acceleration, more positive drive control and less driver fatigue.

For More Details Circle No. 64—Page 397

Exhaust Silencers: Burgess-Manning Co., Libertyville, Ill.—Series of high-velocity steam and air exhaust silencers has been added to the company's line of industrial noise abating devices. The new silencers are designed to eliminate high and low fre-

(*Continued on page* 432)

here's a picture of **NOMAD** *conveyors in ACTION*

SIMPLE? *Extremely!*

EFFICIENT? *Unquestionably!*

LOW COST? *Astonishingly!*

We designed this conveyor on the simple principle of putting "roller skates" on aluminum bottom boards, and then sending the boards gliding over specially designed tracks.

Incidentally—if you feel that the range of work in your foundry is too varied to consider use of bottom boards—how about using our pallets in conjunction with your present flask and mold equipment? This combination is proving to be the answer to the handling problem in the miscellaneous casting shop.

Our tracks, frames, rollers, boards and pallets are all simple, sturdy, effective and inexpensive. The system is easy to install, has a low initial cost, and offers no maintenance problems. NOMAD foundry engineers will help you all the way, from most effective layout to final installation.

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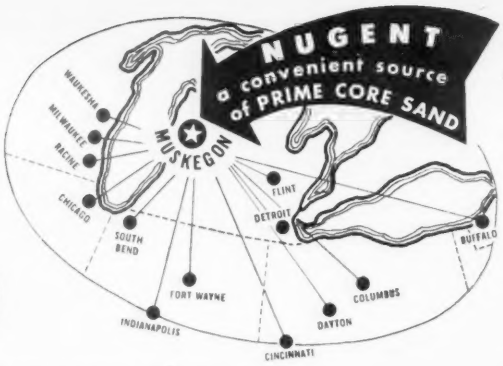
FIVE GRADES of CORE SAND



tested before you use them!

Exclusive with Nugent — 5 grades of dune sand processed from the best Muskegon Dune Sand — dried — graded to a constant AFS grain analysis of 39, 43, 48, 52 and 55 maintained through daily testing. Gives more uniform cores — consistently uniform molds — complete shipping and bulk storage facilities — prompt shipments of sand by rail or truck when you need it — based on over 40 years of "know how" supplying prime core sand.

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CARPENTER BROTHERS, INC.
Milwaukee 3, Wisconsin

GREAT LAKES FOUNDRY SAND CO.
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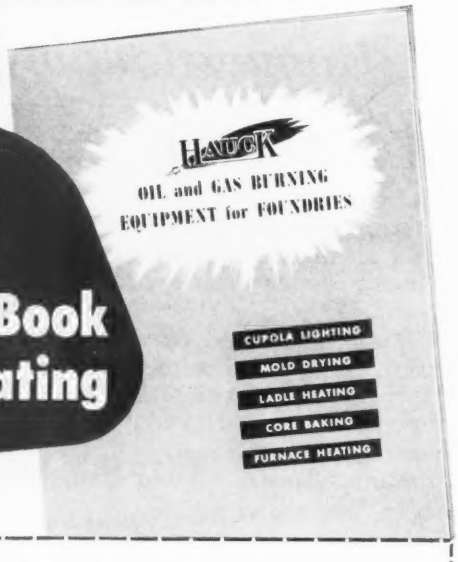
1912 **CANNON** core sand 1954

THE NUGENT SAND COMPANY, INC. **MUSKEGON, MICHIGAN**

Foundrymen!

Here It Is



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The Complete Book on Better Heating

Here's your easy-to-use guide to the selection of oil or gas burners, torches and heaters. It will help you improve operations in mold drying, ladle heating, cupola lighting, preheating furnace linings, core baking, firing melting and annealing furnaces, thawing and drying coal and sand, preheating for welding and other plant services. Yours for the asking—no obligation.

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(*Continued from page* 430)

quency noises caused by high velocity discharge from steam and air devices. They employ specially designed acoustic reactance chambers plus sound absorbing material.

For More Details Circle No. 65—Page 397

Mold Sealer: Presstite Engineering Co., 3796 Chouteau Ave., St Louis 10—Prepared bead-type sealer

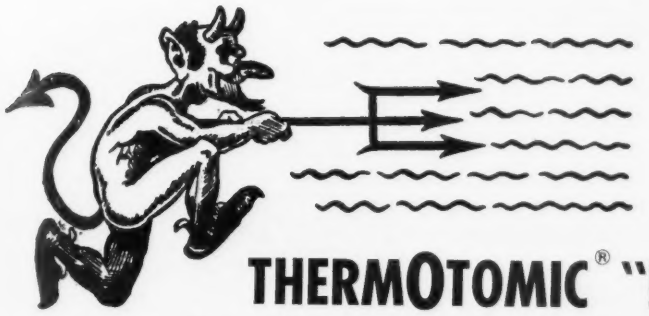
for use between cope and drag is made of synthetic resins and other inert modifiers, with asbestos fiber binder. Known as Kopeseal, it is claimed to be nonoxidizing, nonhardening, nontoxic and nonirritating to the skin, will not give off gas and is completely dissipated by high metal heat. All that remains is a slight residue of asbestos fiber or powder, but not enough to prevent re-use of sand. The sealer is furnished in neat, rope-like beads and is applied by peeling from its special paper backing and placing around the perimeter of the drag. It serves as a gasket-like seal that helps to avoid runouts and to determine whether the cope is properly seated. Material is available in flat pack cartons in lengths of 30 inches and $\frac{3}{16}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, and $\frac{3}{4}$ in. diam.

For More Details Circle No. 66—Page 397

Speed Drive: Louis Allis Co., Milwaukee 7 — Stepless adjustable-speed drive has been designed for operation from alternating current power lines and is available with direct current drive motors in standard frame sizes, ¾ to 15 hp. The supplier claims four advantages for the speed control: Wide speed range where required, adaptability to a variety of optional electrical and mechanical modifications and the use of new simple reliable electronic circuits. The unit is built with speed ranges of 5:1, 20:1, or 50:1, with 100:1 available for some applications. Standard safety features include a

(*Continued on page* 434)

Produce More Castings Per Heat
with



Soffel's
THERMOTOMIC® "HOTOP" LIQUIDIZER

Exothermic Carbon Free Liquidizer For Iron, Steel, Nodular Iron

This new head compound saves feeding metal in risers or feeding heads which can now be reduced in height 40 to 70%

SOFFEL'S THERMOTOMIC HOTOP CARBON FREE LIQUIDIZER is different from other head compounds in that HOTOP LIQUIDIZER does NOT contain powdered metal, is NOT a thermit compound. It is a patented exothermic compound entirely free of carbon, sulfur and phosphorus and can be used without danger of contamination on any ferrous metal or alloy.

HOTOP LIQUIDIZER also saves molding time as less sand is needed in the mold cope due to short height of risers. HOTOP LIQUIDIZER produces a liquid slag well over 4000° F. of heat and insulates the metal. The feeding metal will remain liquid at least 50% longer assuring adequate feeding while the casting cools and solidifies. Piping and shrink cavities caused by premature freezing of the feeding metal are eliminated.

GUARANTEED TO PRODUCE SOLID CLEAN CASTINGS

SOFFEL'S FAMOUS CARBON FREE LIQUIDIZER FOR ALL METALS and ALLOYS

SOFFEL'S EXOTHERMIC CARBON FREE LIQUIDIZER is the leader in major foundries for use on both ferrous and non-ferrous metals and also in ingot production. It is the original scientific non-carbon, exothermic compound for feeding heads and risers.

When applied on the heads or risers CARBON FREE LIQUIDIZER reacts within itself exothermically, producing a temperature above 3200° F. It actually increases the temperature of the feeding metal to a point well above that of the metal in the main body of the casting, thus ensuring that the feeding metal will be the last to freeze. In this manner, shrink cavities in the casting caused by premature freezing of the feeding heads will be eliminated. After the exothermic action has ceased, the LIQUIDIZER forms a soft refractory insulating blanket on the metal. This confines the heat generated by the LIQUIDIZER and aids in maintaining the desired high temperature of the feeding metal in the heads or risers.

SOFFEL'S THERMOTOMIC COMPOUND
PATENTED
FOR ALL METALS and ALLOYS

THERMOTOMIC COMPOUND is a patented Exothermic compound that can be molded into any desired shapes and used as feeding ring inserts under risers or as facing application where it is desired to maintain fluidity of the casting metal. THERMOTOMIC permits reversal of the trend towards large feeding heads and risers, making it possible to use heads that are shorter and more compact with 1½" feeder openings. This permits easy removal of the casting feeding heads and sharp reductions in cleaning and finishing costs. When THERMOTOMIC is used as inserts or as facing mixed with molding sand in the mold, heat at thin metal sections is retained until the thick main body of the casting has solidified, thus eliminating shrink cracks and improving grain structure and tensile strength. For use in green sand molds, use THERMOTOMIC W. P. (Waterproofed)

NOTE: SOFFEL'S CARBON FREE LIQUIDIZER NO. 5 is recommended for use on top of feeding heads in conjunction with THERMOTOMIC COMPOUND. For aluminum castings, use THERMOTOMIC ABC and AL-X31 LIQUIDIZER. When ordering a trial sample, advise the kind of metal to be used on.

U. S. Patents No. 2,490,327 and No. 2,500,097

PITTSBURGH METALS PURIFYING COMPANY

World's Largest Manufacturer of Fluxes and Purifiers For All Metals and Alloys

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While we have just about every size and type of chaplet you can think of, there is a *possibility* that we don't have the *exact type* you require. In that case, we can design and develop *just the chaplet* to suit your requirements! We have all sorts of working samples available, and are always ready to ship them in a hurry to those who wish to try them.

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- CHAPLET NAILS
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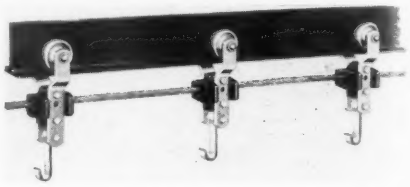
(*Continued from page* 432)

fail-safe circuit in case of failure and current-limit control to safeguard driven machine and motor from overload, jamming or too rapid acceleration.

For More Details Circle No. 67—Page 397

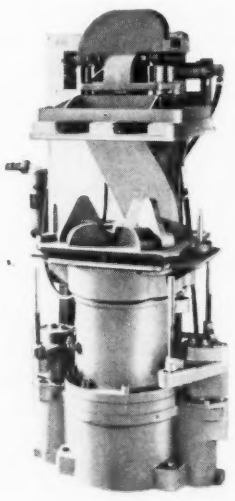
Cable Conveyor: E. W. Buschman Co., 4421 Clifton Ave., Cincinnati 32—Increased cable life, easier lubrication and maintenance, and a



more compact layout are claimed for new lock cable conveyor system that will operate on existing snub-lock design systems. The trolleys feature cylindrical bushings permanently locked on accurate centers by high pressure swaging to preformed galvanized or stainless cable. Two halves of an adaptor block, to which are attached the trolley and load-bearing hook, are bolted to the bushing. Cable is supplied in ¼-in. size with locks at 12 and 15 in. centers and in ⅜-in. size with 12 3/32 and 15 1/16-in. centers to operate on standard sheaves. Nine wheel types are available for various operating conditions.

For More Details Circle No. 68—Page 397

Jar-Squeeze Machine: Tabor Mfg. Co., 6225 Tacony St., Philadelphia 35—Flask lift molding machine



jars and squeezes simultaneously. The jar-squeeze function is said to promise higher conveyor line production. Total time required from rolling on a flask to striking off a finished mold is 10 to 15 seconds, even when flask is deep and mold is difficult, according to the manufacturer. Machine is shockless and re-

(*Continued on page* 436)

Cut core costs...

double core production with

FOUNDREZ 7101

Your cores will cost less per ton, and bake out faster, if you switch from ordinary core oils to RCI's FOUNDREZ 7101 — a water-dispersing, phenol-formaldehyde binder.

Because FOUNDREZ-bonded cores bake out in about half the time of oil-bonded cores, you can double your production without adding any extra oven equipment.

What's more, you get a superior core. Tensile strength and hardness are greater. Permeability is increased. Gassing is reduced. Hot strength is higher. Less cereal binder is needed. And shake-out is better, saving time and material in cleaning finished castings.

Get the full facts on FOUNDREZ 7101 by writing for Technical Bulletin F-1.

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Creative Chemistry . . .
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Synthetic Resins
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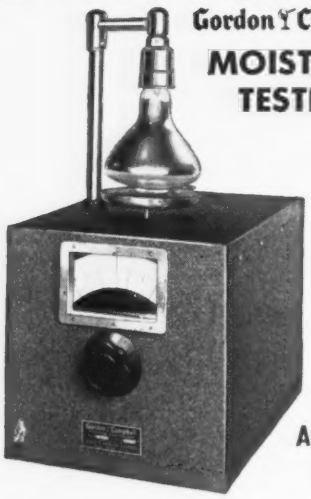
Sodium Sulfate
Sodium Sulfite

Guessing Moisture Content?

IT DOESN'T PAY!

USE THE Gordon-Campbell MOISTURE TESTER



ACCURATE FAST

The moisture content of sand mixtures is too important a factor in the production of good castings to be determined by guesswork. Frequent testing is the only sure guide to maintaining the most favorable moisture percentage.

The Gordon-Campbell Moisture Tester offers an easy, fast, accurate method of finding moisture content. With only a few minutes required for a test, the sand can be corrected promptly to avoid scrap losses.

Gordon-Campbell sand testing units offer the latest improvements for checking these critical properties of sand mixtures: clay content, core hardness, and core strength. The tests are quick, and no calculations are required. They offer the simplest approach to sand control.

Write for full particulars on Gordon-Campbell sand control units.

Gordon-Campbell sand testing units conform to the recommendations of the Committee on Foundry Sand Research of the American Foundrymen's Society.

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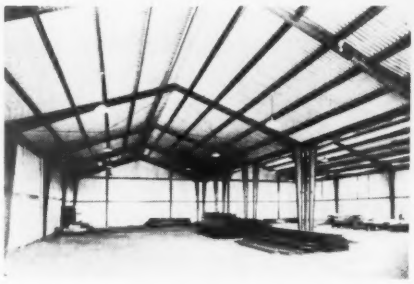
(Continued from page 434)

quires no foundation. It can be set above the floor or on an iron grid over a conveyor belt and return system. Completely automatic control provides uniformity of molds and less physical work for molders.

For More Details Circle No. 69—Page 397

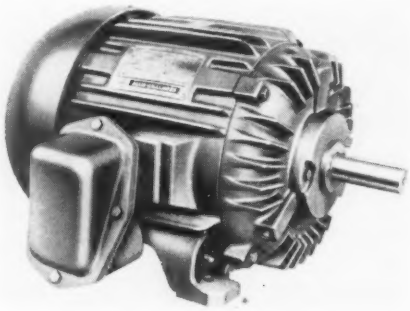
Clear Span Building: United Steel Fabricators Inc., Wooster, O.—Clear span rigid frame building for



industrial and commercial use provides a 40 ft clear span without central columns and a full 14 ft clearance to the eaves. Any length building may be constructed in 20 ft bay lengths. A clip and wedge sheet attachment simplifies erection and eliminates all holes through the sheets. Sides and roof are covered with 24 gage, galvanized box-corrugated sheets. Corrugations are 1 in. deep and 4 in. on centers. Doors and windows can be provided in any side bay or end of the building.

For More Details Circle No. 70—Page 397

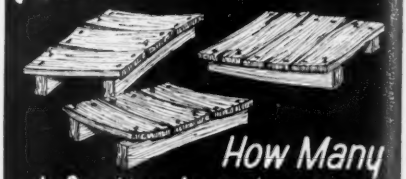
Induction Motors: Allis Chalmers Mfg. Co., General Machinery Division, Milwaukee 1—Complete new



line of alternating current squirrel cage induction motors in frame sizes 326 and smaller is designed to follow the newly established NEMA standards. The new motors, designated as type G, will retain all former features of the company's motors while offering certain improvements inherent in the redesign. Under the new standards, the 5-hp, 1800-rpm motor, illustrated here, will be on the 215 frame. Construction-wise the new motors will have cast iron frames and end shields. Rotors will be pressure-cast of aluminum. Bearings will be grease lubricated, medi-

(Continued on page 438)

REPLACE THESE PROFIT STEALERS



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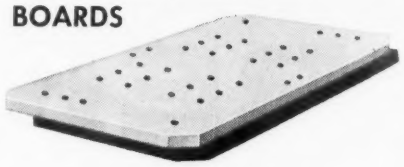
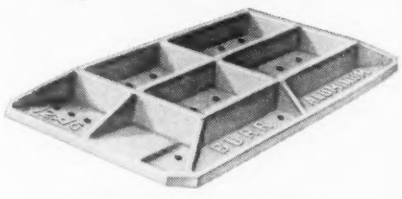
PUT YOUR MOLDS ON A SOLID FOUNDATION

BURR ALUMINUM

PERMANENT BOTTOM BOARDS



- One piece—can't warp, twist, burn, or come apart
- Eliminate repairs and replacements
- Cut rejects and run-outs to the bone
- Increase production
- Increase your profits
- Last indefinitely



GET THE FACTS TODAY

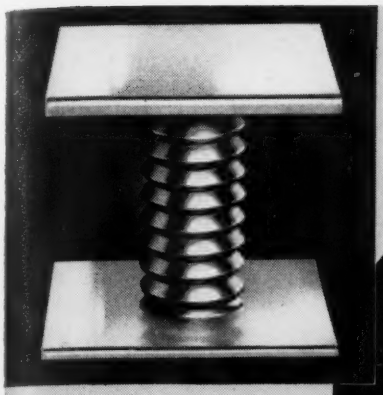
We can prove that replacement of wood boards with Burr Aluminum Permanent Boards will save you money.

Write for full information and prices.

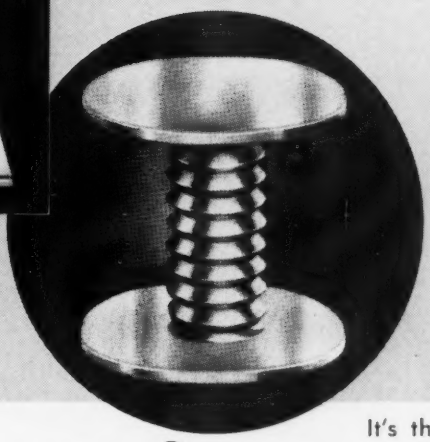
BURR ALUMINUM

Box 31 Burr Oak, Michigan

SEE THEM AT BOOTH 407 FOUNDRY CONVENTION



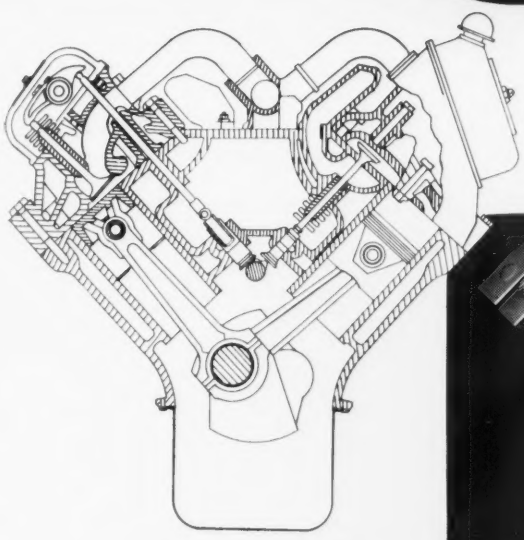
Double Head Thread Stem Chaplets for use on heavier castings. Available in heights for practically any section of metal. Stem diameters range from ⅛" to 1¼". Designs to meet all core and mold conditions.



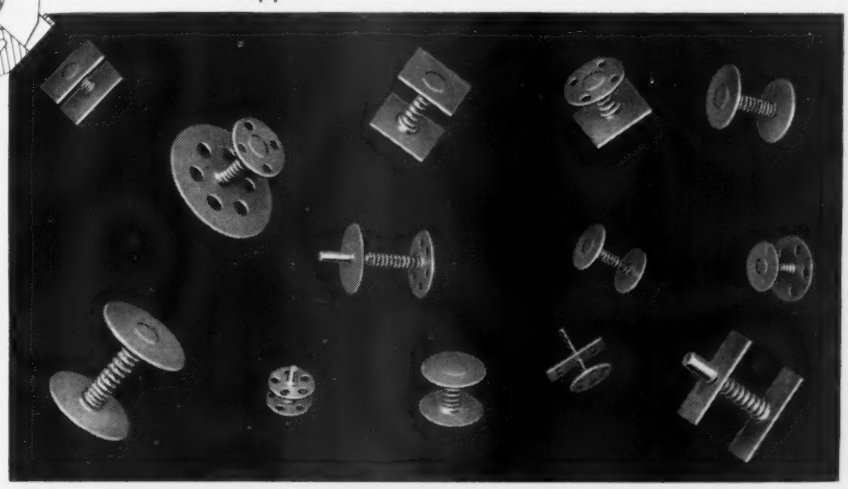
It's The Unusual Features of *Milwaukee* CHAPLETS

that insure Leak-Proof fusing and proper core support

It's the sharply cut "thread stem" design that insures leak proof fusing. Metal melts at the edges first, that's why the sharp edges "burn in" quickly and completely to insure instant fusing which results in freedom from leakers. Here is a design where fusion takes place at exactly the right speed to give you both instant fusion plus proper core support.



Cross Section of a standard "V" engine — a typical casting where proper "burning in" is imperative. Milwaukee Thread Stem Motor chaplets ARE doing an outstanding job on this kind of casting.



MILWAUKEE THREAD STEM MOTOR CHAPLETS

When light castings are subject to gas, steam, water, and other pressures, Milwaukee Thread Stem Motor Chaplets are specially recommended because they cut scrap losses due to leakers. Perforated heads allow trapped gases to escape . . . the lighter mass eliminates chill and because metal melts from edges, you have more edges resulting in a better opportunity for melting and complete fusing.

Add to this, uniform high quality, sturdiness of construction, an excellent protective coating and manufacturing to precision tolerances, and you soon discover why Milwaukee Chaplets are the favorite of the industry.

Motor Chaplets are available in round or square double heads from ⅜" to 1" with the famous "thread" stem from 1/16" to ¼" in diameter.

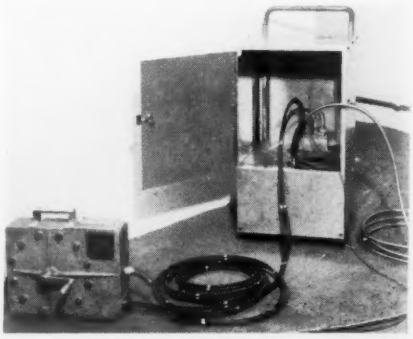
If you have an unusual product or production problem where a specially designed chaplet or chill is required, we invite your engineering staff to consult with ours for the proper solution to your problem. **Milwaukee Chaplet & Mfg. Co., 1023 South 40th St., Milwaukee 15, Wis.**

MILWAUKEE CHAPLET

(*Continued from page* 436)
um series, double shielded ball bearings, capable of relubrication without dismantling the motor. According to the company, the new motors will be available initially in frame sizes 182 and 184, which now are in production. Larger frame sizes will become available at about five month intervals.

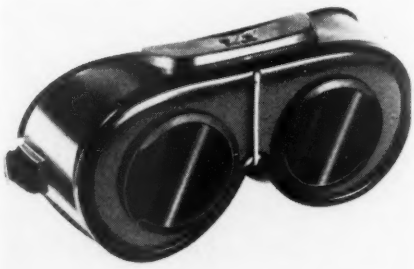
For More Details Circle No. 71—Page 397

Exposure Shield: Technical Operations Inc., 6 Schouler Ct., Arlington, Mass.—Exposure shield is designed for use in cobalt 60 radiography to permit the safe handling of strong radioactive sources for three specific requirements: Exposures in internal locations, radiography where electric power is not available and panoramic exposures. The shield is available in two models, depending upon the volume of cobalt to be handled. Both models consist of three basic units: The source shield (a lead-filled, steel shell, in which the source is stored), the source tube (flexible and adjustable up to 21 ft, through which the source is moved into position for exposure) and the control cable (25 ft long and by which the operator safely exposes the source). The three units are housed in a cabinet, mounted on wheels for maneuverability.



For More Details Circle No. 72—Page 397

Welding Goggle: Watchemoket Optical Co., 232 West Exchange St., Providence, R. I. — Welding goggle that provides draft ventilation at the top and center to prevent fogging has been added to the company's line of safety equipment. Large openings for ventilation are shielded by a vented hood. The opaque black soft plastic frame is large enough to fit over prescription glasses and is designed to form-fit the contours of the nose and face. Lens holder has pockets for replaceable glass filter lenses. The inside cover lens lessens the danger of glass splinters reaching the eye, if impact should break the filter lens.



For More Details Circle No. 73—Page 397

Floor Coating: Pennsylvania Salt Mfg. Co., 1000 Widener Bldg., Philadelphia 7—Skid-proof surface coating for concrete, wood and metal floors has been developed for use in plants or shops where oils, greases and chemicals create safety hazards and maintenance problems. The coating is a grit-like material anchored in a matrix of resilient neoprene and bond-

(*Continued on page* 440)

DUREX

"DUROX" and "D • SAVAGE"
Standard Fire Brick Products
Proven by Actual Foundry Service

FIRE CLAY
FIRE BRICK
BONDING CLAY
DUREGAN

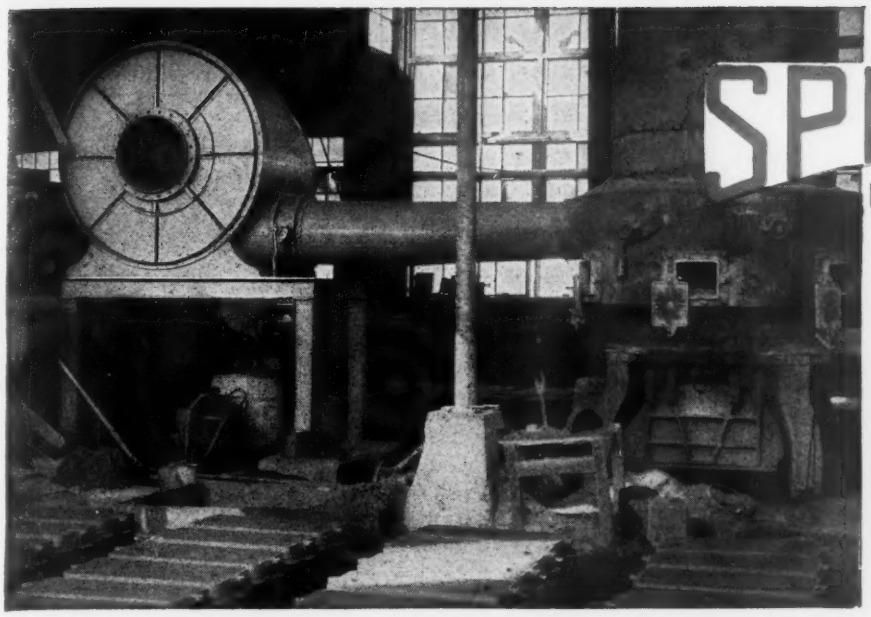
AIR-PLACEMENT GUN
FOR CUPOLA MAINTENANCE OR ELECTRIC FURNACE LININGS

The most economical and efficient air-placement gun. Ruggedly built for years of service with minimum repairs. Installation, demonstration and training to your own men by our own engineers.

"DUREGAN" SUPER-DUTY PRODUCT — BAG OR BULK

"Duregan" can be used in all types of guns on the market today. It is carefully screened and sized to insure maximum density with minimum rebound. All quartz particles thoroughly coated to assure a strong bonded lining and long-life refractory service.

DUREX REFRACTORIES CO. JACKSON, OHIO
Phone: Jackson 109
5252 Broadway, Chicago, Ill. Phone: Uptown-8-1322



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KEEP

MELTS

M-O-V-I-N-G

with

SPENCER TURBO-COMPRESSORS

SPENCER HARTFORD

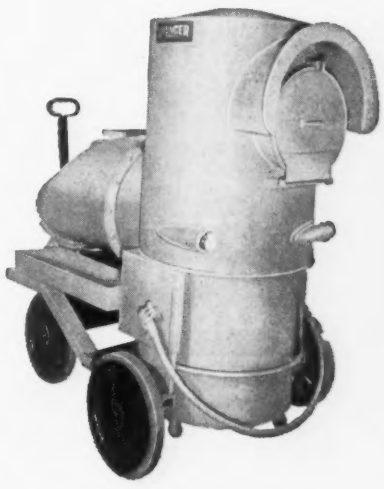
FOUNDRY EQUIPMENT MEMBER FEMA MANUFACTURERS ASSOCIATION INC.

A good, dependable air supply is the heart of any foundry operation. Once the amount of air for a given charge is determined, the Spencer Turbo will continue to provide the desired amount, day in and day out for years without interruption.

This dependability is built-in. With wide clearances, only two bearings to grease and an all-metal bridge-like construction, there is little that can go wrong even in the most severe and prolonged service.

Spencer Turbos are particularly noted also for their compact, light weight construction and comparatively quiet operation. They can be mounted anywhere—overhead, or on the floor without special foundations.

The control may be manual, by means of a calibrated ammeter and blast gate, or complete automatic air-weight control with recording charts may be used. Ask for the Spencer Foundry Bulletin No. 112.



7½ HP *Heavy Duty*

And for Foundry Housekeeping——

Spencer Industrial Portable Vacuum Cleaners are solving the housekeeping problem in all types of foundries, large and small. Periodic overhead cleaning, picking up molding sand and cleaning molds, patterns and finished castings are a few of the jobs that make Spencer Vacuum pay for itself in a few months. Bulletins on request.

SEE SPENCER AT BOOTH NO. 1120

THE SPENCER TURBINE COMPANY • HARTFORD 6, CONNECTICUT

SPENCER
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414B

Erie BUCKETS ARE A *Specialty* — NOT A SIDELINE

Right from the start we thought enough about buckets to make them our specialty. That was 34 years ago. They're still our bread and butter.

Today, thousands of Erie units all over the world are turning in top performance. That's because they were built with a complete understanding of what they had to do.

Why not let our engineers review your set-up. There's no obligation. And, based on past experience, we're sure we can offer a helpful suggestion.

Write for BULLETIN 403, Dept. F54

FORMERLY ERIE STEEL CONSTRUCTION COMPANY

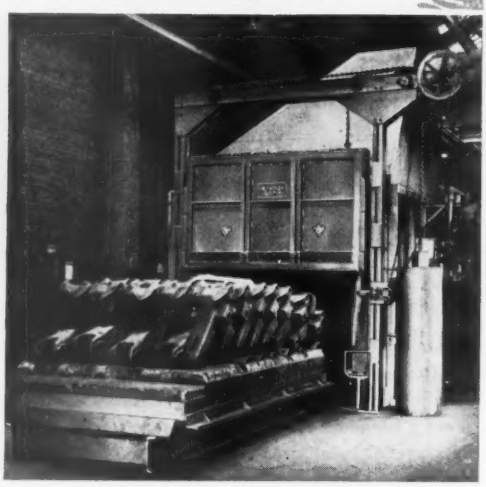
ERIE STRAYER CO.

SAME PEOPLE • SAME PRODUCTS • JUST A NEW NAME

854 GEIST ROAD • ERIE, PENNSYLVANIA

For Normalizing, Annealing and Heat Treating . . .

JOHNSTON CAR BOTTOM FURNACES



Engineering experience is apparent in the smooth operation of the Johnston Car Bottom Furnace. Roller bearings in car and door hoist shafts, mechanical car seals, and power operated car pullers are just a few of many practical features. Johnston "Reverse Blast" low pressure burners for oil or gas assure clean, economical, efficient heat for annealing, normalizing, and stress relieving.

Write for Bulletin F-240

Johnston Equipment for the Foundry
● Melting Furnaces ● Heating Torches ● Ladle Heaters
● Heat Treating Furnaces ● Burners, Blowers, Controllers
Over Thirty Years Experience in Design and Manufacture.

THE JOHNSTON LINE — SAFETY DEPENDABILITY

JOHNSTON MANUFACTURING CO.
2825 EAST HENNEPIN AVE.
MINNEAPOLIS 13, MINN.

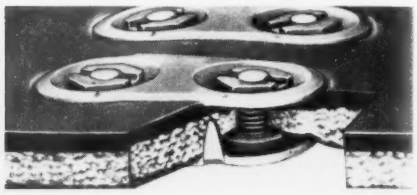
ENGINEERS & MANUFACTURERS OF INDUSTRIAL HEATING EQUIPMENT

(*Continued from page* 438)

ed to the floor with an adhesive primer. Manufacturer states the material is highly resistant to fumes, spillage from acids, alkalies, salt solutions and solvents at temperatures up to 220°F, is waterproof, impervious to oils and greases and easily cleaned with commercial detergents and cleaners.

For More Details Circle No. 74—Page 397

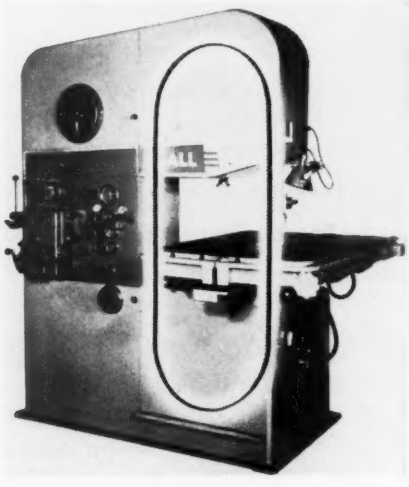
Belt Fastener: Flexible Steel Lacing Co., 4607 Lexington St., Chicago 44—Belt fastener is designed



for joining conveyor belts where scraper and plows are used. Top plates are beveled at both ends so that scrapers will ride over them. This keeps protrusion above the belt to a minimum and less wear on scrapers and improved cleaning of the belt is claimed as a result. The fasteners are made in one size for joining belts $\frac{5}{16}$ to $\frac{1}{2}$-in. in thickness, with not more than 500 ft centers.

For More Details Circle No. 75—Page 397

Band Saw Machine: DoAll Co., 254 North Laurel Ave., Des Plaines, Ill.—Semi-automatic band machine



is adaptable to production line machining operations such as slotting, slitting, shaping, notching on alloy steels and other tough metals and materials. Machine is push-button operated from a centralized control panel by hydraulic power feeds and other hydraulic controls. Feed rates and pressures are adjustable. Saw guide post adjustment, automatic tool tensioning and table position for

(*Continued on page* 442)

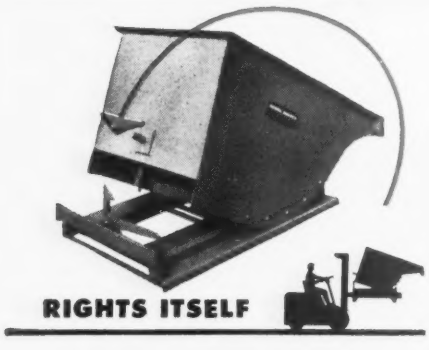
"Yes, we're well satisfied!"

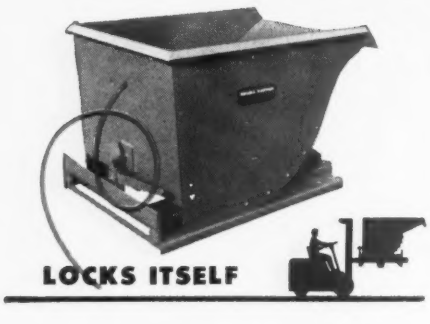
Ask any user of METAL BLAST abrasives whether he's satisfied with the efficiency and economy of ANNEALSHOT or SUPER-ANNEALSHOT. You're bound to get just such an answer as this. For these are *good* abrasives. They're made from the best materials—formed and heat treated as best we know how—and priced as low as we can afford. So, why not try them and be well satisfied, too?

METAL BLAST, Inc., 872 East 67th St., Cleveland 3, Ohio.

METAL BLAST
will be there . . .
AFS FOUNDRY SHOW
Booth 1703-5

METAL BLAST ANNEALSHOT
chilled shot and grit
SUPER-ANNEALSHOT
malleable shot and grit





pays for itself!

It's the safe, sensible, economical way to handle wet or dry, hot or cold bulky materials. Simple, one-man operation does the job with amazing speed . . . *cuts cost of hand unloading by at least 50%.*

This rugged Roura Self-Dumping Hopper is built to withstand the terrific knocks and bangs of rough usage. Extra heavy gauge metal and welded construction mean years of dependable service. Fits any standard fork or platform lift truck. Also available mounted on live skids or with malleable or rubber tired casters. Sizes from ½ to 2 cubic yards. Thousands in use in America's biggest industries.

ROURA
Self-Dumping
HOPPER

WANT MORE FACTS? Clip this coupon . . . attach to your letterhead . . . sign your name . . . and mail to . . .

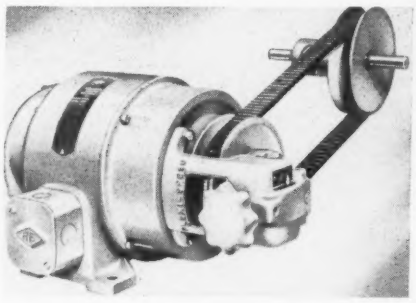
ROURA IRON WORKS, INC.
1417 Woodland Ave., Detroit 11, Michigan

(*Continued from page* 440)

angular cuts also are hydraulically actuated. Coolant facilities are adjusted by finger tip control. Wide speed ranges are possible (40 to 10,000 fpm in one range) and operator sets dial selector to material to be machined to determine such constants as type of tool, velocity, feed pressure and cutting rate. The blades for the machine are offered in three varieties of pitch and five different widths from ½ through 1 in.

For More Details Circle No. 76—Page 397

Adapter End Bell: Reuland Electric Co., Alhambra, Calif.—Motor design features a special adapter end



bell for direct mounting of a flexible drive that is claimed to eliminate the need for a separate, foot mounted index support. With this adapter the motor and drive can be mounted as a single, compact, aligned unit. Company motors adapted for this direct mounting system are available in ½, ¾ and 1 hp.

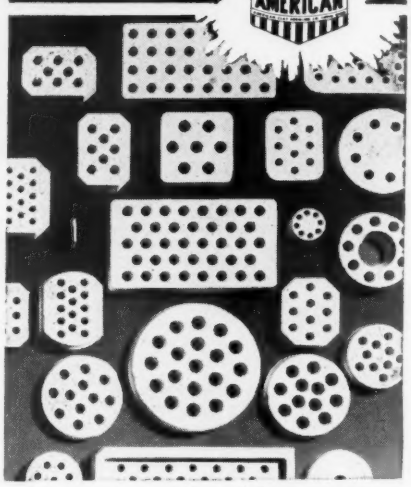
For More Details Circle No. 77—Page 397

Polishing Stand: Crane Packing Co., 1800 Belle Plaine Ave., Chicago—Portable polishing stand is de-

signed to eliminate difficulty in attaching and holding flat optical polishing paper on a metal plate. The stand holds the paper taut to avert buckling or raised portions to cause dubbing the edges of the work. A 50 yd roll of 12-in.-wide optical paper is available for use and is threaded across a steel plate that has been lapped to a high degree of flatness. The stand has been developed primarily for polishing work pieces pri-

(*Continued on page* 444)

AMERICAN
CERAMIC
STRAINER CORES
are
"Foundry Tested"



Here are just a few of the American Ceramic Core designs available

Foundries all over the world are solving production problems with American Ceramic Strainer Cores. These foundries have fewer rejects too . . . because American Cores remain round and uniform during the pouring operation — slag remains on TOP of the core. The result? An evenly poured slag-free casting every time.

American will quote prices on any size or shape core . . . so write today for samples and descriptive literature. There's no obligation, of course.

THE AMERICAN CLAY FORMING CO.
Tiffin, Ohio—Tyler, Texas
Manufacturers of Specialized Refractories for over 30 Years

NEW!

CLECO

No. 14 GE—170

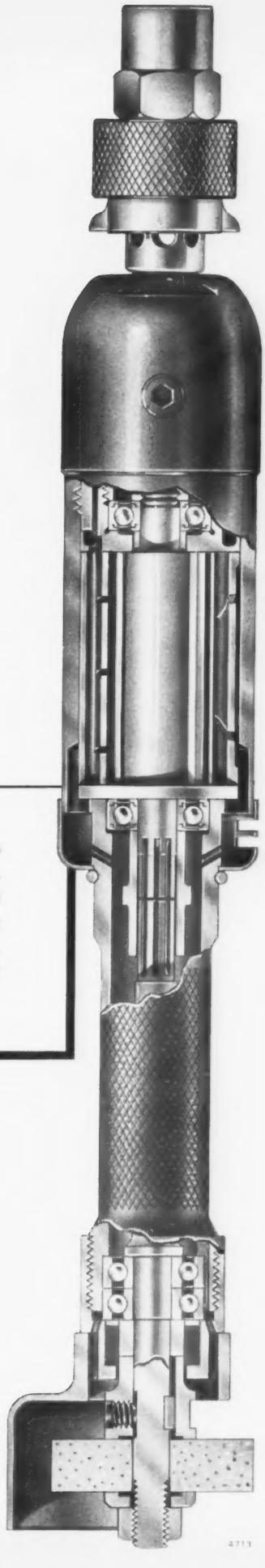
GRINDER

Featuring a new, more powerful motor, this tool is suitable for a host of applications including heavy duty die grinding and many foundry finishing jobs. It is fast, rugged, and maintenance-free — a real time and money saver.

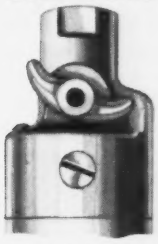
SPECIFICATIONS

Length	14¾ inches
Weight	5½ lbs.
Free motor speed	17,000 rpm
Size wheel	2 inch

Illustration shows the grinder equipped with Quick-As-Wink® Throttle. Other types of throttles are available if desired.



Optional safety lever throttle



Optional thumb throttle

NEW: No. 14 motor is powerful enough to take heavy cuts without stalling, yet light enough for easy handling.

NEW: Splined coupling permits quick removal of grinding wheel shaft and bearing without disassembling the motor.

NEW: Air cooled precision bearings for cooler running and longer bearing life.

CLECO AIR TOOLS

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Division of REED ROLLER BIT COMPANY

AIR TOOLS AND ACCESSORIES

Grinders • Sanders • Rotary Drills • Riveters
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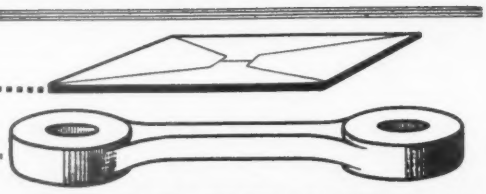
For a demonstration, write Cleco Division of the Reed Roller Bit Company, 5125 Clinton Drive, Houston 20, Texas. In Canada: Cleco Pneumatic Tool Company of Canada, Ltd., 927 Millwood Road, Toronto (Leaside), Ontario.

Gamma rays.....
unexposed film.....
steel casting.....

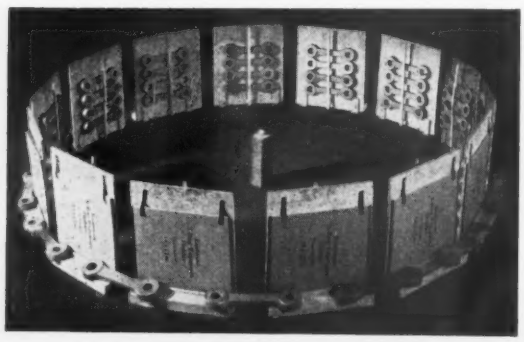


RADIUM RADIOGRAPHY

improves foundry practice and production

Compared with X-ray radiography, radium radiography is new, but its peculiar advantages have been finding increasing favor with steel foundries. The first commercial radiograph with radium was made in 1930—and by 1950 250 steel foundries throughout the country were using radium radiography. The constant activity of radium, the even dispersion of its rays with a minimum of scattering; the portability of the equipment and simplicity of operation all combine to make radium radiography an economical nondestructive method of testing. Write today for case histories and additional information. *Your requirements promptly supplied.*

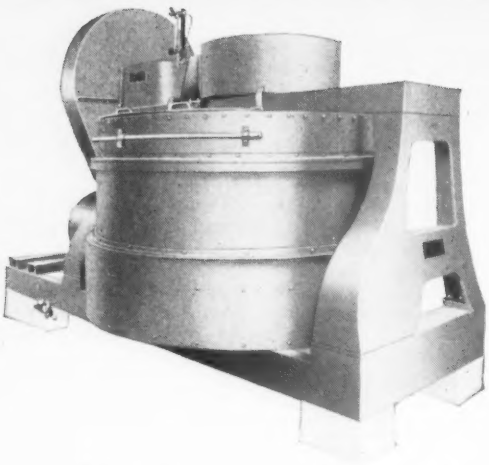
Illustration shows 60 steel castings being photographed simultaneously. The gamma rays, flying in all directions, go through all the castings at once, making 60 exposures of the 60 castings



RADIUM CHEMICAL CO., INC.

New York: 161 East Forty-second St., Chicago: Marshall Field Annex Bldg., Los Angeles: 3723 Wilshire Blvd.

TRIED AND TESTED WAY TO
CUT *SAND-MIXING* COSTS!



THE NO. 4½ "LANCASTER" MIXER. *Heavy duty unit in open or closed pan types. Available with full batch stationary or separately driven elevator hoppers.*

Balanced mixing action is the proved method of reducing sand preparation costs. Since 1933, "Lancaster" Mixers have pioneered the major developments in counter-current mixing plus *balanced mulling action.* "Lancasters" provide high output without resort to "powerhouse" methods that may excessively elevate batch temperatures or compress the body into hard, unmixed flakes. Power "miser" construction reduces operating costs. Write today. No obligation.

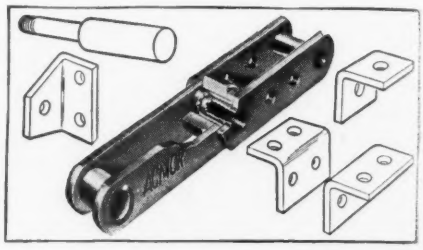
POSEY IRON WORKS, *Inc.*
Brick Machinery Division
LANCASTER, PENNSYLVANIA

(Continued from page 442)

or to inspection during surface grinding or lapping operations, in laboratories or on small run polishing jobs.

For More Details Circle No. 78—Page 397

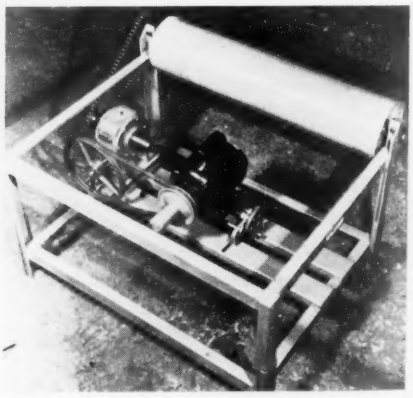
Conveyor Chain: Acmor Conveyor Chain Co., 17100 Miles Ave., Cleveland 28—Hollow pin conveyor



chain is asserted to be ideally suited for construction of automation units. Manufacturer states that the chain need not be ordered from the factory with special attachments because almost any that the work might require can be added. The illustration shows chain links with holes and attachments for use with chain, which is made in pitches from 2 to 6 in. Extra-heavy chain can be furnished when the quantity ordered justifies a special run.

For More Details Circle No. 79—Page 397

Conveyor Drive: Sage Equipment Co., 30 Essex St., Buffalo 13—Power unit is designed to convert



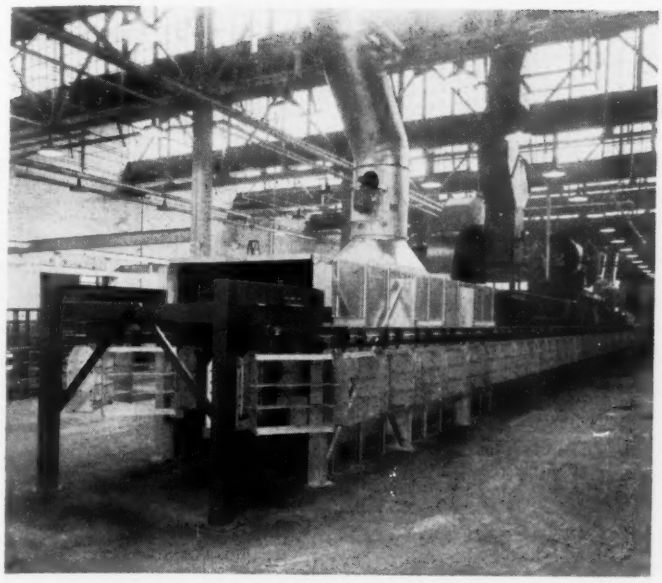
gravity roller conveyors to powered belt or live roller units when material handling changes require traction for moving materials in horizontal, inclined or declined planes. Power is available from 1/3, ½ or ¾-hp motors suitable for 110-v, 60-cycle, single-phase or 220-440-v, 60-cycle, three-phase current. Special current characteristics can be supplied to meet individual needs.

For More Details Circle No. 80—Page 397

Non-Skid Agent: Monroe Co., 10703 Quebec Ave., Cleveland 6—Synthetic, heavy-bodied plastic material containing special solvents and abrasive fillers, is claimed to form a wet

(Continued on page 446)

Core Drying Ovens



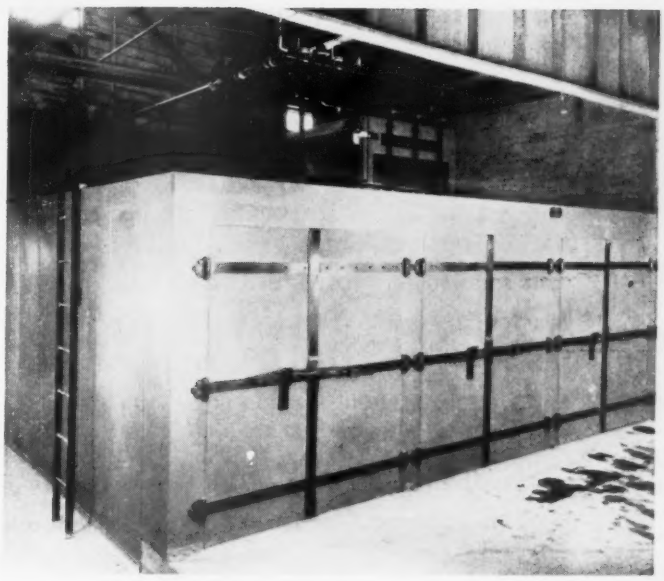
CONTINUOUS CONVEYORIZED CORE BAKING OVEN

The oven shown at left handles cores weighing from a few ounces to thirty pounds each. It has a production capacity of up to five thousand pounds per hour in a continuous loading, preheating and cooling cycle, providing uninterrupted flow of finished cores from makers benches to storage room.

IOI ENGINEERING VERSATILITY

BATCH TYPE CORE BAKING OVEN

Illustrated at right is a multi-compartment rack type batch oven. Cores on steel racks are loaded into the several compartments by lift trucks. Equipped with high volume air systems, with close temperature control in each section, it produces cores with high impact resistance and greater tensile strength.



Designers and Builders of Vertical, Multi-pass and Straight-through Conveyorized Ovens and Various Sizes of Batch Ovens

INDUSTRIAL IOI ENGINEERING VERSATILITY **OVENS, INC.**

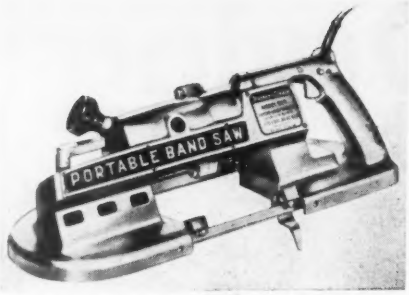
13811 TRISKETT ROAD CLEVELAND 11, OHIO

(*Continued from page* 444)

or dry slip-proof surface. The material is troweled on and the manufacturer states it can be used over wood, concrete, steel, tile, mastic or terrazzo floors. Applications include stairways, ramps, catwalks, aisles, shower rooms and lavatories. Tile red, green, light and dark gray colors are available.

For More Details Circle No. 81—Page 397

Portable Band Saw: Porter-Cable Machine Co., 33 Exchange St., Syracuse 8, N. Y.—Completely portable metal band saw weighs only 16 lb and is said to be the only metal-cutting saw that is fast and light enough to be used free-hand in any position. The saw has a stock-cutting capacity up to 3¼-in. by 4¼-in. Blades are available in a range of 6 to 32 teeth per inch for all types of cutting. Entire machine is 7½-in. high, 7½-in. wide and 19½-in. long and the housing is die cast satin finished aluminum.



For More Details Circle No. 82—Page 397

Foot Bath Tray: General Scientific Equipment Co., 2700 West Huntingdon St., Philadelphia 32—Round, rubber, non-slip waffle tread foot bath tray is said to be safe from slipping and will resist the inroads of antiseptic solutions used to prevent athlete's foot and other foot infections. Measures 19 in. diam, is 3½-in. deep and has applications in shower and wash rooms in plants, factories and institutions.

For More Details Circle No. 83—Page 397

Breaker Strip: United States Rubber Co., Rockefeller Center, New York 20—Conveyor belt breaker strip is made of nylon combined with cotton. The new strip makes the belt more flexible in the lengthwise direction, thus taking up the shock of impact during loading operations. Additional cotton has been added to increase resistance to gouging and tearing of the carrying surface cover. The breaker strip is imbedded in a soft white rubber compound to make the belt resistant to severe impact, according to the manufacturer.

For More Details Circle No. 84—Page 397

Hand Grinder: Metal Removal Co., 1546 North Orleans St., Chicago 10 — Hand grinder with variable speeds from 700 to 50,000 rpm is powered by a 1-hp, 3 phase motor with a belt pulley drive and is said to have the advantage of operating accurately at selected speeds, even

(*Continued on page* 448)

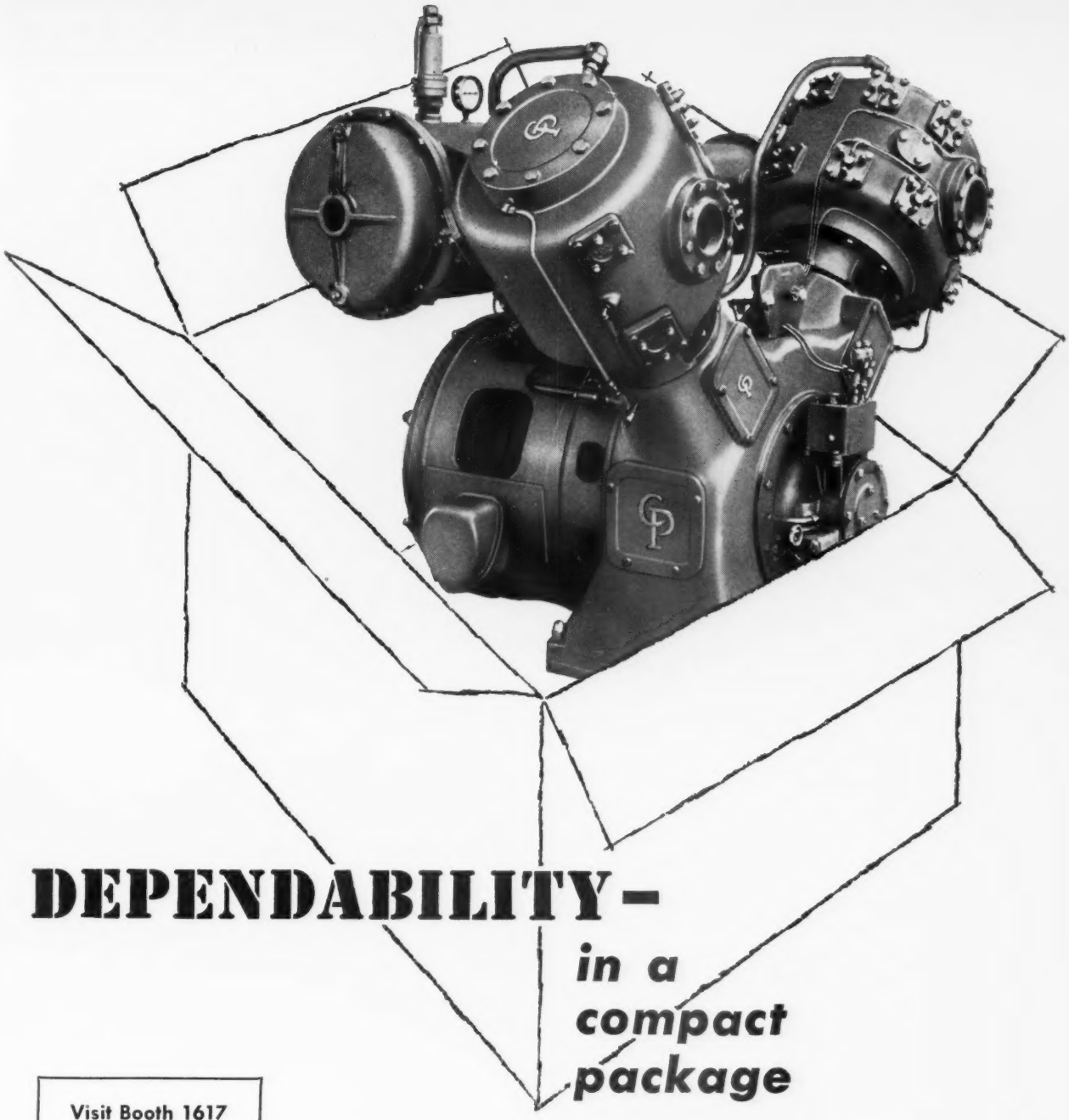
IF YOU MAKE YOUR OWN
STRAINER CORES
WE INVITE YOU TO MAKE THIS TEST
WITH PORCELAIN PRODUCTS PORITE CERAMIC STRAINER CORES

Are you, now, making your own sand strainer cores in your plant—and are you looking for better castings at lower cost? Then—make this test—Free.

We will be pleased to receive your request for free samples from our large stock of standard size *ceramic* strainer cores. For your own test—simply tell us the sizes and quantities of sand strainer cores you now use—or send us samples of your sand cores. Try PORITE Ceramic Strainer Cores—put Porite to the test. Don't miss this opportunity. Write today.

Porcelain Products' Ceramic Strainer Cores are available in a wide range of standard sizes—or, on special order, in sizes to meet your specifications.

60 years
Porcelain Products, Inc.
PP INC.
FINDLAY, OHIO



DEPENDABILITY—

in a compact package

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at the
Foundry Show

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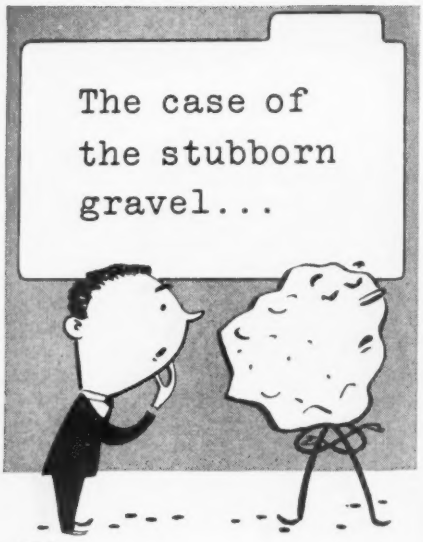
Rammers
Core Box Removers

With floor space at a premium, CP's space-saving Type Y Compressor is the answer! Shipped as a package ready for easy installation on a simple, inexpensive foundation, the dependable Type Y is designed for continuous operation and long life with high efficiency. Location of air inlet and discharge openings on cylinders permits the simplest and most compact piping arrangement. The "Y" arrangement also provides maximum accessibility to cylinders and to the easy-to-clean, easy-to-maintain shell-and-tube intercooler.

The Type Y has roller main bearings, precision connecting rod bearings, and multi-step capacity regulation. Available from 75 to 250 hp; 410 to 1663 c.f.m. capacity, and in single or multi-stage designs for a wide range of pressures. *Chicago Pneumatic Tool Co., 8 East 44th St., N. Y. 17, N. Y.*

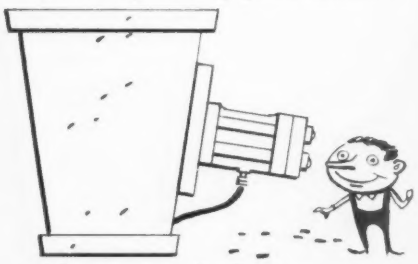
Chicago Pneumatic

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES



Yes, believe it or not, chaos really reigned in this case of a Washington gravel plant . . . all because of a pile of stubborn gravel.

It bridged . . . it arched . . . it plugged . . . and generally tied up production.



After we got the facts on the case, we recommended a CLEVELAND vibrator, and in nothing flat that stubborn gravel was moving continuously and smoothly.

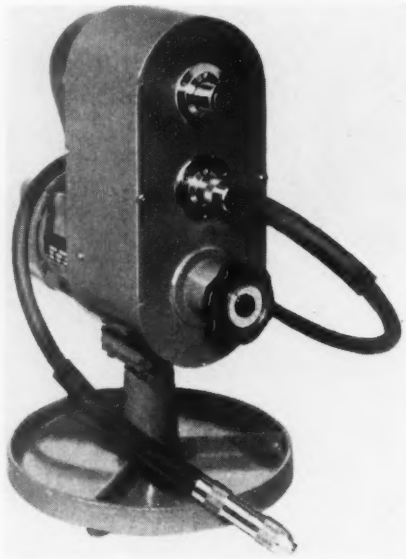
Tell us your materials handling problem, or ask for our detailed literature.

AIR *and* ELECTRIC

2788 Clinton Avenue • Cleveland 13, Ohio

(*Continued from page* 446)

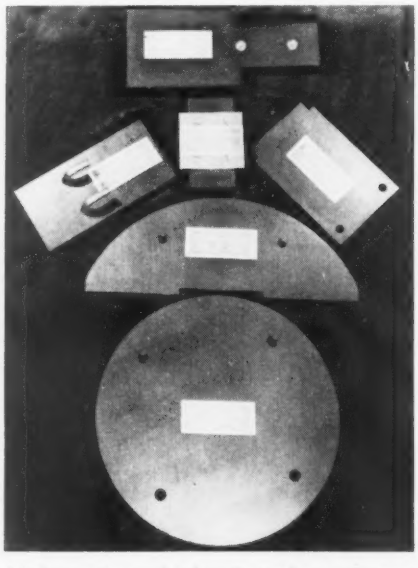
under full load. Wide range of speeds are manipulated by a hand dial which controls a flexible drive shaft. The



grinder will drive carbide burrs, mounted wheels, abrasive disks, buffing wheels, and grinding wheels from 1/16 to 7 in. diam.

For More Details Circle No. 85—Page 397

Shot Blast Liners: Latrobe Steel Co., Latrobe, Pa.—Liners for shot blast equipment made from a



high carbon, high chromium, 4 per cent vanadium steel are claimed to be excellent for resisting abrasion. All liners are ground before heat treatment to eliminate decarburization and to put a smooth surface on the material for additional wear. All curved liners are die quenched for proper radius and to insure their fitting the machine.

For More Details Circle No. 86—Page 397

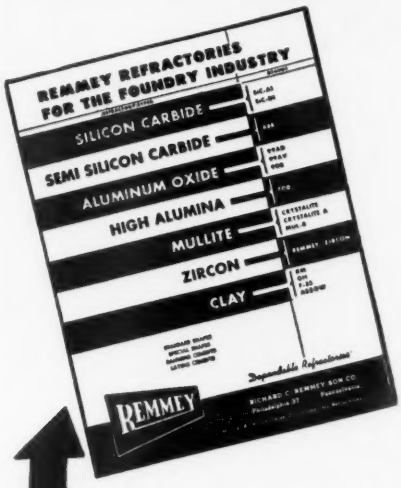
Metal Detector: Dings Electronics Inc., 4740 West Electric Ave., Milwaukee 46—Electronic metal de-

(*Continued on page* 450)

Foundry Refractory

COSTS CAN BE CUT!

. . . Know the *right* refractory for the job!



Send for the new, complete bulletin on REMMEY Foundry Refractories—

. . . an informative, 2 color bulletin covering the entire line of REMMEY Refractories for the Foundry Industry. Silicon Carbide, Mullite, Aluminum Oxide, Ramming Mixes, etc.

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Dependable Refractories

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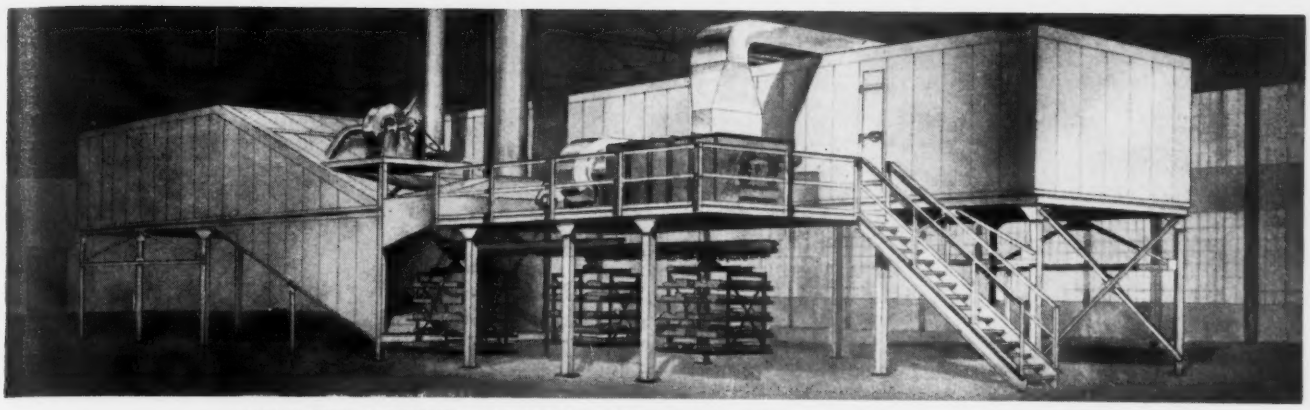
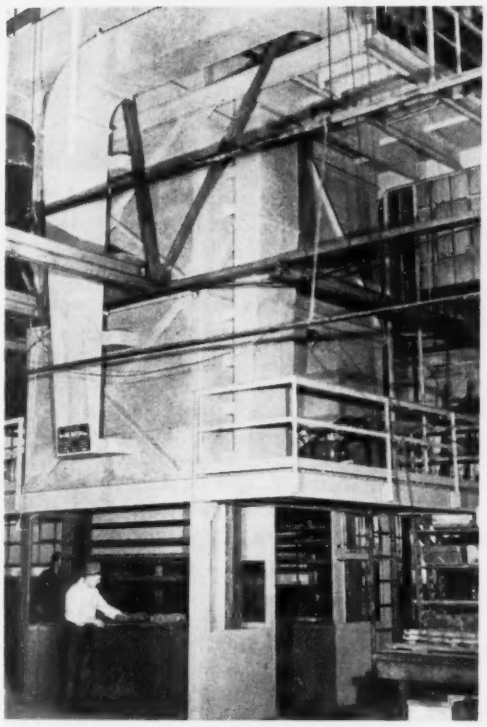
RICHARD C. REMMEY SON CO.
Philadelphia 37, Pennsylvania

Manufacturers of Silicon Carbide, Mullite, Aluminum Oxide, Zircon and Clay Refractories



CARL-MAYER HORIZONTAL MONORAIL CORE OVEN at Eclipse Aviation Co. Patent No. 2355814.



CARL-MAYER VERTICAL CORE OVEN at G.&C. Foundry Co. Patents No. 2,628,087 and 2,257,180.

"BIG" *engineering brings big foundry oven jobs to—*

CARL-MAYER

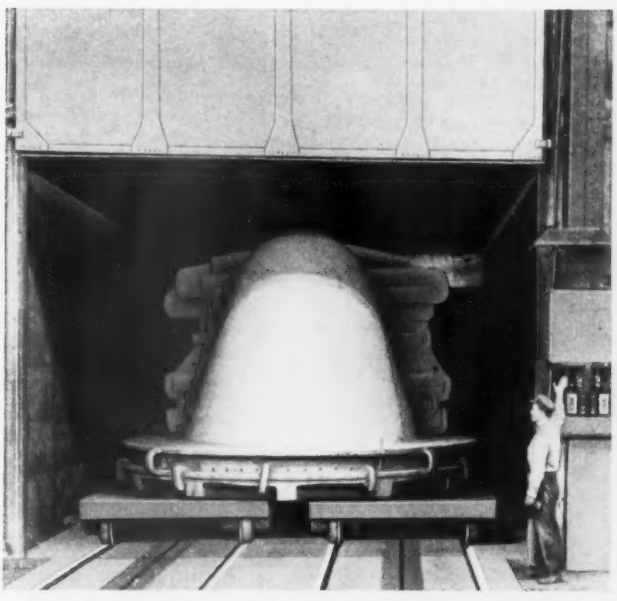
Carl-Mayer designs embody patented features which contribute to highest efficiency and economy in operation.

It will pay you to consult us on your next core baking and mold drying problem. We build ovens of all types and sizes, also other types of industrial ovens and furnaces. WRITE FOR BULLETIN NO. 53-CM.

SEE OUR EXHIBIT AT THE FOUNDRY SHOW—BOOTH 1807

CARL-MAYER CORE AND MOLD OVENS ARE SERVING CONCERNS LIKE THESE:

Aluminum Co. of America
American Brake Shoe Co.
American Radiator Co.
Ashland Malleable Iron Co.
Blaw-Knox Co.
Brown Industries
Buick Motor Div. of General Motors Corp.
Bucyrus-Erie Co.
Cadillac Motor Div. of General Motors Corp.
Centre Foundry Co.
Columbia Steel Corp. (U. S. Steel Corp.)
Crucible Steel Castings Co.
Dunkirk Radiator Co.
Eclipse Aviation Division of Bendix Aviation Corp.
Electric Autolite Co.
Ford Motor Co.
Fremont Foundry Co.
G. & C. Foundry Co.
General Electric Co.
General Motors Corp. and Subsidiaries
Gilbert & Barker Co.
General Steel Castings Co.
Golden Foundry Co., Inc.
Henry Kaiser Corp.
W. O. Larson Foundry Co.
Mesta Machine Co.
F. E. Meyers & Bro. Co.
Oil Well Supply Co. (U. S. Steel Corp.)
Packard Motor Car Co.
Pittsburgh Steel Foundry Corp.
H. B. Salter Co.
Shenango Penn Mold Co.
Standard Foundry Co.
Union Brass & Metal Mfg. Co.
Union Steel Castings Co.
West Michigan Steel Castings Co.
A. C. Williams Co.
Whiten Machine Works
Whiting Corp.



CARL-MAYER MOLD OVEN. One of a battery of two at Pittsburgh Steel Foundry Corp. Capacity: 100 tons per charge (each oven). Patented.

THE CARL-MAYER CORPORATION

3030 Euclid Ave., CLEVELAND, OHIO

Backed by reputation and over 30 years' Experience

GOES OVER BIG for wheeling and dumping heavy materials

Specify Sterling No. 119
HEAVY-DUTY CART
Pneumatic-tired wheels or steel wheels

FIFTY years ago Sterling men had faith that wheelbarrows would "go over big" if made so rugged they would cost users *less per year.* Response from men of industry proved this Sterling idea to be right! Through the years, Sterling progress has provided wheelbarrows made the way *you* needed them . . . easy-wheeling, longer-lasting, to cost you less per year, designed for the specific work *you* do with wheelbarrows and carts. See the whole Sterling line.

Write for Bulletin or see nearest dealer.

Some areas open for dealerships. Write . . .

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STERLING WHEELBARROW CO., Milwaukee 14, Wis.

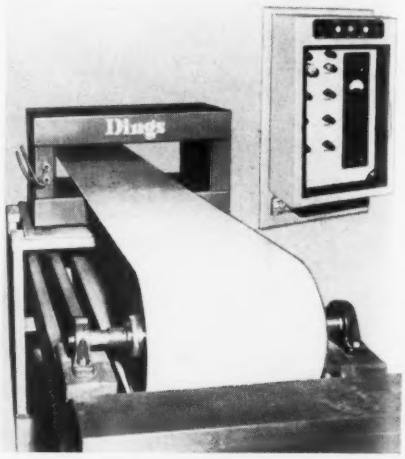
Sterling WHEELBARROWS

Look for this Mark of STERLING Quality

A 7846-14

(*Continued from page* 448)

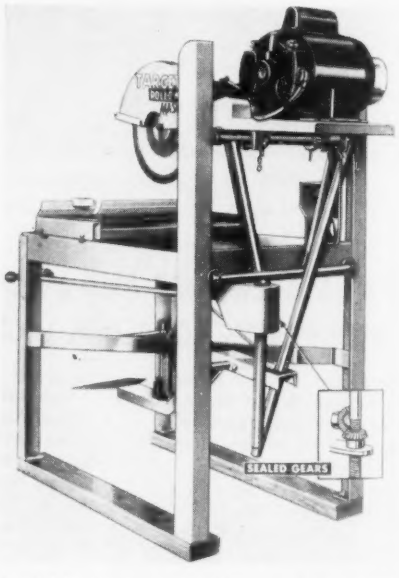
tector is built for general industrial service and for deep burden service such as mining. The detector is sensitive to all metals, ferrous or non-ferrous, and is said to detect even



minute metal particles, signaling their presence and thereby protecting machinery and product quality against tramp metal damage. A variety of signal and reject systems are available to provide automatic detection with manual, semiautomatic or fully automatic rejection of tramp metal.

For More Details Circle No. 87—Page 397

Masonry Saw: Robert G. Evans Co., 6315 Brookside Plaza, Kansas City 13, Kans.—Masonry saw is ad-



justable to any position and features a safety lock which fixes the cutting head in one position. Two toggle pins provide the lock and for portability of the unit these toggle pins are released and the cutting head lifted from the frame. The blade may be positioned and cutting accomplished by a foot pedal or an exact depth cut can be made by set-

(*Concluded on page* 452)

For Top Quality Castings—

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Portage (Wis.) Silica
Century Molding
*Ottawa Blackhawk Silica
Muskegon Lakesand
Tenn. & Ind. Molding
Utica Crude Silica
Silko Molding
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Red Flint Annealing
New Jersey Molding
Gallia Red Molding
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ABRASIVES
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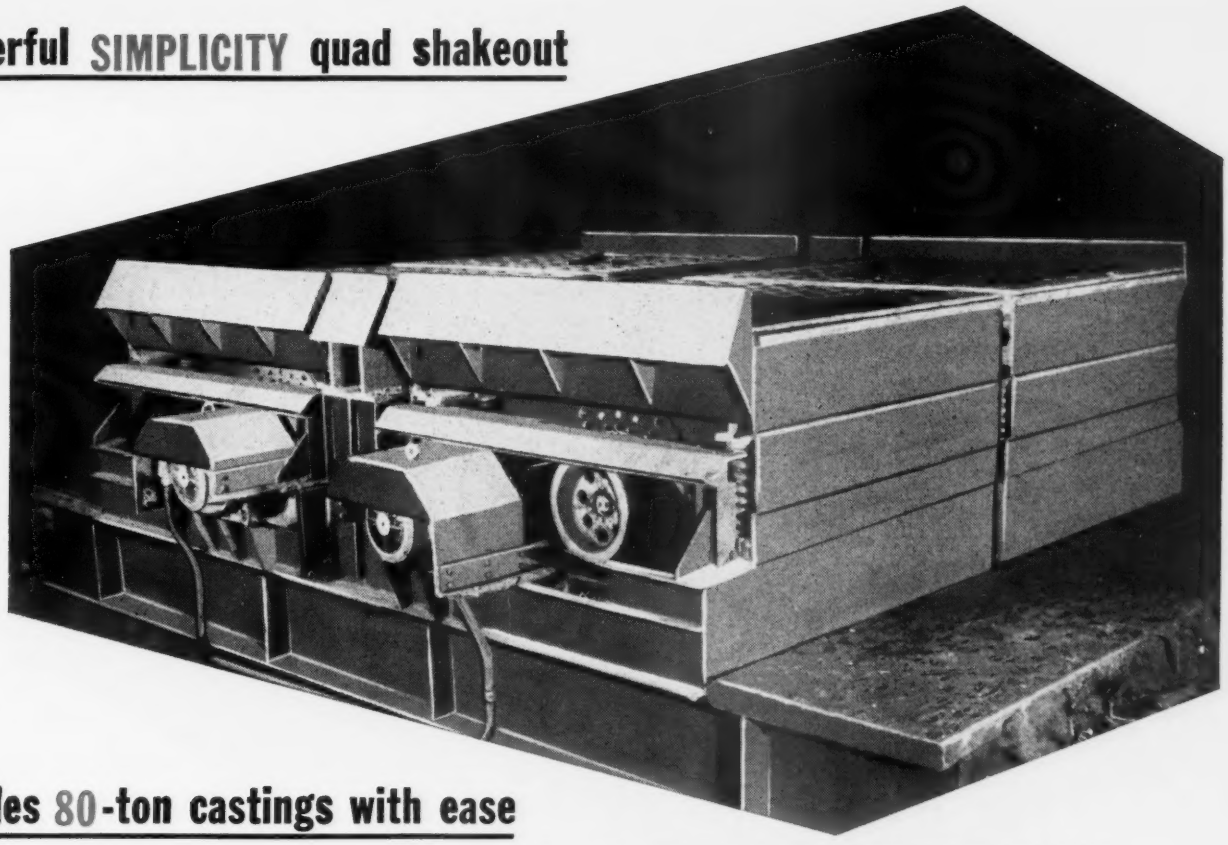
Powerful SIMPLICITY quad shakeout

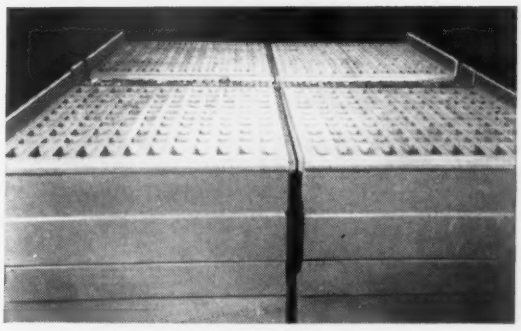


handles 80-ton castings with ease

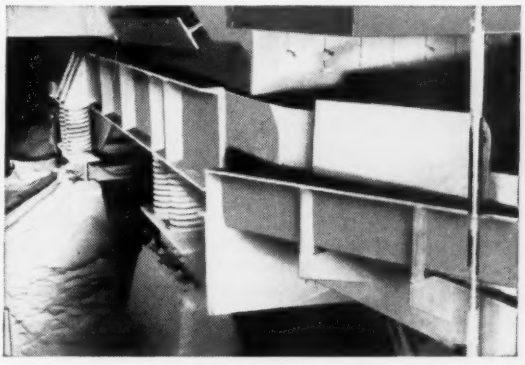
This is the Simplicity spring-mounted quad shakeout, made up of four 7′ x 8′ steel-decked Simplicity Model OM units, that is handling huge 80-ton tank hull castings for a well-known foundry.

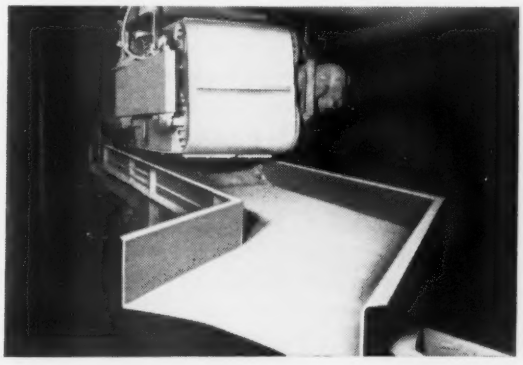
After plenty of pounding by the big 80-ton castings, the deck of the Simplicity unit is still in sound condition. Controlled vertical vibration, concentrated at the deck, eliminates travel of flasks and castings and does a more thorough shakeout job in less time.

In the same foundry, a 4′ x 20′ Model OA Simplicity Feeder, installed under a hopper beneath the shakeout, feeds sand to the return conveyor for reclaiming without hang-up or bridging in the hopper.



This 3′ x 20′ Simplicity Model VS Conveyor, connected to the Simplicity Feeder, insures the smooth, even flow of sand back to the reclaiming unit. It is equipped with a Dings self-cleaning magnetic separator that removes all metal particles from the sand.





136

SEE US AT THE FOUNDRY SHOW BOOTH NO. 1529

Sales representatives in all parts of the U.S.A.
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Model PG-5065 6" wheel grinder for rigorous heavy duty production.

40 Factory-Owned Service Warehouses, Coast to Coast, To Give You Fast, Dependable Service.

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Send me the MALL Pneumatic Tool Catalog.

*Name*_____

*Company*_____

*Address*_____

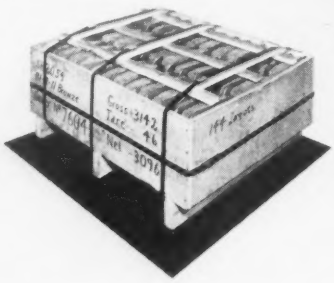
MU-93

(Concluded from page 450)

ting the blade and feeding the material through without using the foot pedal.

For More Details Circle No. 88—Page 397

Palletized Ingots: I. Schumann & Co., 4391 Bradley Rd., Cleveland 4—Company will ship brass and



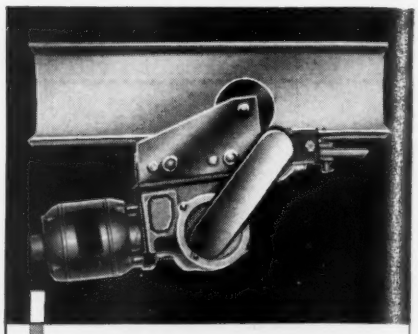
bronze ingots on sturdily constructed wooden pallets to all foundries which can accept shipment in this manner. Convenience in handling during shipping, unloading and storage operations is claimed to result from use of such pallets. Pallets are clearly marked as to weight and contents, thus facilitating metal inventory control. Pallets can be reused later in the foundry for other purposes.

For More Details Circle No. 89—Page 397

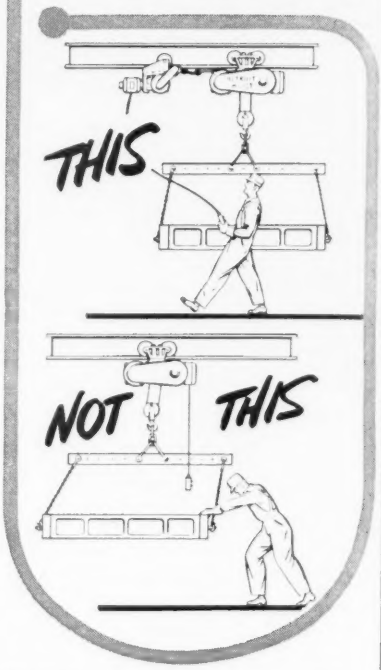
Pneumatic Hammer: Dotmar Industries Inc., 103 North Burdick St., Kalamazoo, Mich.—Lightweight

air hammer featuring a "fire arm" type trigger fits the hand like a pistol. A recessed air control screw in the handle is turned to adjust air flow, one direction to increase impact, the other way to lessen impact. Recoil has been eliminated by a fast reciprocating plunger. Spring grip chuck prevents tools from falling out. Safety ports release air when tool is idling and hammer will not operate unless tool is pressed against work. Operates on air pressure as low as 40 psi and at this pressure can deliver 3000 blows per min. A wide range of tools is available.

For More Details Circle No. 90—Page 397



Trojan TRACTOR for POWER TRAVEL



Attached by a simple draw-bar, the Trojan Tractor quickly converts existing, slow, hand-pushed hoists and light overhead cranes into fast, power-traveled units. Save time, effort; reduce material handling costs.

- *Ask for Trojan Tractor Bulletin 810 today.*

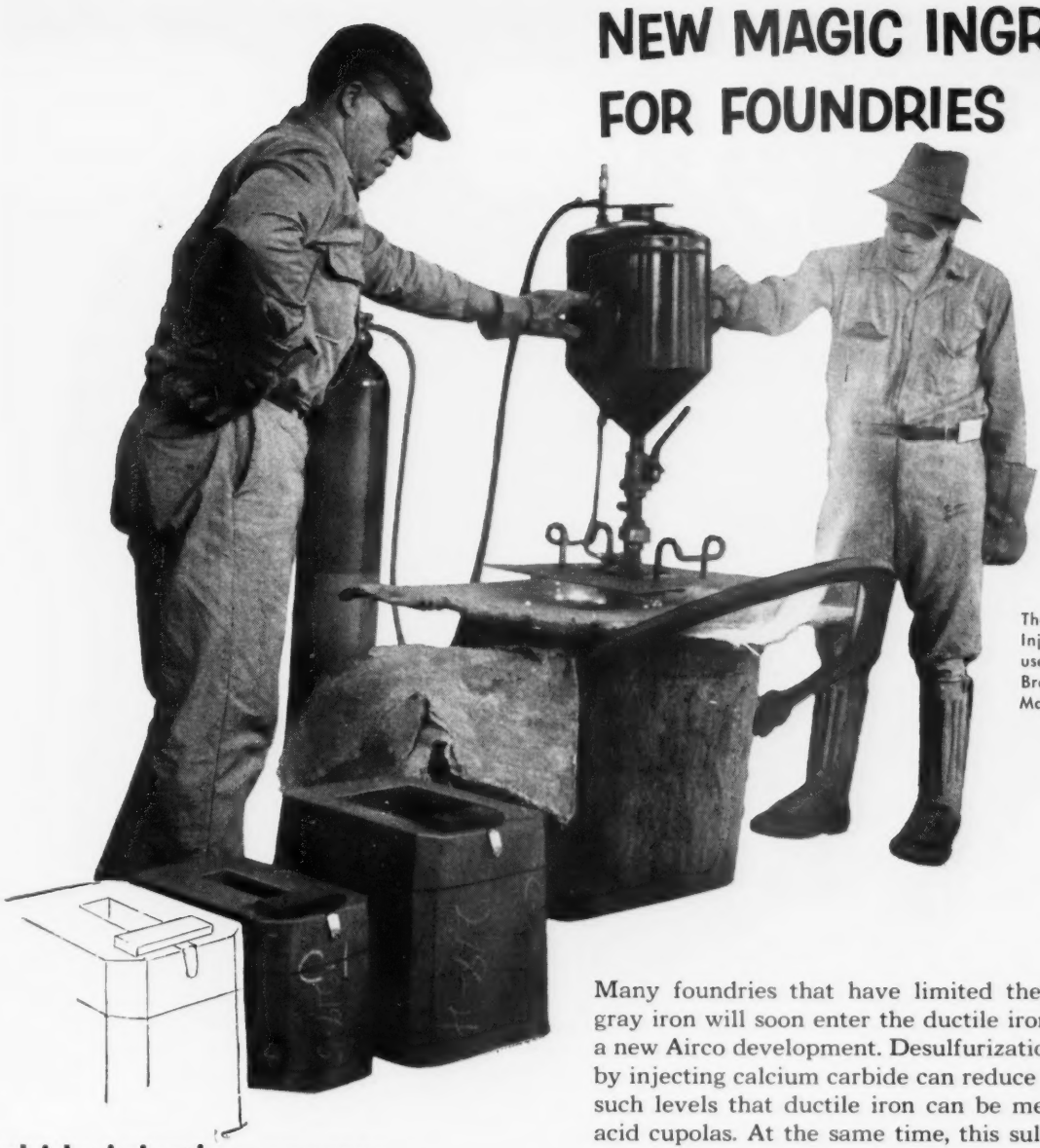
DETROIT HOIST & MACHINE CO.

8275 Morrow St., Detroit 11, Mich.

Designers and Manufacturers of Hoists and Cranes

Since 1905

NEW MAGIC INGREDIENT FOR FOUNDRIES



The Airco Carbide Injection Process in use at the American Brake Shoe Company, Mahwah, N. J.

Carbide injection process developed by AIRCO® cuts ductile iron alloy costs up to 50 percent

permits melting in acid cupolas

Visit Airco and check up on carbide injection equipment in Booth 328 at the 1954 Foundry Show, Cleveland, May 8-14.

Many foundries that have limited their production to gray iron will soon enter the ductile iron field, thanks to a new Airco development. Desulfurization of molten iron by injecting calcium carbide can reduce sulfur content to such levels that ductile iron can be melted in ordinary acid cupolas. At the same time, this sulfur content — as low as 0.01 percent — makes it possible to cut the amount of expensive alloy elements drastically with no sacrifice of mechanical properties. Foundries already using Airco carbide injection report savings of up to 50 percent on these alloy costs alone!

The injection equipment itself is simple and inexpensive. It consists of a hopper and an injection tube through which the powdered carbide is injected into the molten iron by a stream of nitrogen. The operating expenses are the cost of the gas and the carbide, trivial in comparison to the savings they make possible.

Calcium carbide injection is a fruitful result of Airco Technical Service's constant effort to find new profitable techniques for customers. If you have a welding, cutting or metallurgical problem, why not let Airco help you develop the most practical approach to it? It can pay big dividends.

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Grinding Wheels

Remove Faster METAL

When high-speed stock removal is required, even to the closest tolerances, use Chicago Resinoid Grinding Wheels. They have greater strength, longer life, and have been proven for efficiency. Available in the size and grain necessary for the job.

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City ..... Zone ..... State .....

TRADE PUBLICATIONS

For more details on these items use reply card—page 397

BELT CONVEYOR IDLERS: C. O. Bartlett & Snow Co., 6200 Harvard Ave., Cleveland 5—Pictures, cutaway drawings, cross-section views and diagrams are used in bulletin 111 to cover line of self-aligning troughing, flat carrying, picking table and antifriction idlers. Data tables on belt speeds, typical load cross sections and capacities also are included.
For More Details Circle No. 161—Page 397

METALLIC ABRASIVES: Cleveland Metal Abrasive Co., 887 East 67th St., Cleveland 8—Descriptive material on selection of the proper abrasive, an explanation of the shot peening and abrasive impact cleaning processes, a detailed SAE specification chart and other data are available in catalog 1153.
For More Details Circle No. 162—Page 397

IMPACT MACHINES: Baldwin-Lima-Hamilton Corp., Testing Equipment Dept., Philadelphia 42—Bulletin 4211 offers detailed descriptive information on the design, construction and uses of two impact machines, one for use on plastics and the other for metals. The plastics model has a maximum capacity of 48 ft lb while the metals model has a maximum capacity of 240 ft lb.
For More Details Circle No. 163—Page 397

METAL CUTTING: Victor Saw Works Inc., Middletown, N. Y. — Pocket size guide offers helpful information on proper blade selection and use of metal-cutting saw blades. Information is presented in sections covering hand, power and band sawing. Each section contains tips on how to choose the right blade for the job and lists precautions to be taken by the operator.
For More Details Circle No. 164—Page 397

MATERIAL CONTAINERS: Union Metal Mfg. Co., Dept. MH-611, Canton, O.—Booklet MH-811 describes containers used to work-position, dump, store, collect and transfer materials and scrap varying in size and form from small stampings to long, wieldy shears or trimmings. Containers displayed range in size from 2-oz receptacles for delicate instrument parts to huge production positioning hoppers.
For More Details Circle No. 165—Page 397

INDUCTION MOTORS: Electric Products Co., 1725 Clarkstone Rd., Cleveland 12—Bulletin 37-205 offers data and dimensions of standard NEMA frame size motors from ½ to 125 hp.
For More Details Circle No. 166—Page 397

PALLETIER: Barrett-Cravens Co., Industrial Truck Division, 4609 South Western Blvd., Chicago 9—Book presents specifications and dimensional drawings of eight models of fork trucks with capacities from 1000 to 8000 lb in a range of lifting heights. Cantilever type construction permits the trucks to handle a wide range of jobs including loading, unloading, lifting, stacking, material movement and other warehousing chores.
For More Details Circle No. 167—Page 397

INDUSTRIAL EQUIPMENT: Worthington Corp., Harrison, N. J.—Bulletin WP-1099-B61 contains information about special features, types, sizes and capacities of company's line of industrial equipment. Centrifugal cooling systems, condensers, coolers, compressors, oil, gas and dual fuel engines, centrifugal pumps, steam turbines and other steam power plant equipment are covered.
For More Details Circle No. 168—Page 397

CONTROL INSTRUMENTS: Bristol Co., Waterbury 20, Conn.—Furnace and oven control instruments and accessories carried in stock are listed in bulletin P1262. These include indicating pyrometers and controllers, permanent mounting or portable, indicating thermometer controllers, traveling oven recording thermometers and combustion safeguards.
For More Details Circle No. 169—Page 397

REFRACTORIES: Mullite Refractories Co., Shelton, Conn.—Data on development and physical properties of a super-refractory plus separate sections on details and uses of ramming mixes, mortars, patching mixes, castables, plastic mixes and special refractory products are included in catalog.
For More Details Circle No. 170—Page 397

BIN LEVEL INDICATOR: Bin-Dicator Co., 13946 Kercheval Ave., Detroit 15.—This 20-page book describes and illustrates a complete line of pressure-actuated bin level indicators which show the level of granular, pulverized and semiliquid materials stored in tanks, hoppers and bins.
For More Details Circle No. 171—Page 397

AIR CYLINDERS: Petch Mfg. Co., 463 York, Detroit 2—Catalog contains complete engineering data regarding five different models of automotive air cylinders ranging from 1½ to 6-in. bore.
For More Details Circle No. 172—Page 397

TECHNICAL SERVICE: Foundry Service Inc., 260 Madison Ave., New York 16—Book explains company's

(*Continued on page 456*)

famous throughout the world
BT Moulding machine
MACHINES WITH A WORLD WIDE REPUTATION
See Stand 1440
at the Foundry Show
BRITISH MOULDING MACHINE CO. LTD
FAVERSHAM KENT

THE MASTER OF

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IN INDUSTRY

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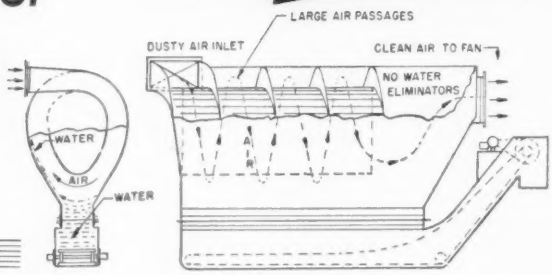

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Recirculation of the air is accomplished without causing condensation, because of the extremely low humidification of the air by the **AIR TUMBLER.**

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1½, 2½, 5 and 10 ton cap.

By swinging the boom over the side of gondola cars *"KRANE KAR can unload 50 to 55 tons of pig iron and malleable steel in 3 hours,"* reports a Midwestern foundry. Speeds Unloading into storage piles and bins . . . Loading of scale cars and charging buckets . . . and Handling of big castings through grinding and finishing operations.

KRANE KAR Lifts, Transports, and Spots loads of any shape or size up to 10 tons. Using hook or magnet, ***KRANE KAR*** safely and efficiently handles Patterns, Flasks, Molds, Cores, Sand Boxes, Rails, Ingots, Billets, Slabs, Scrap . . . and, with a bucket, Coke, Sand, Clay, Coal. Rubber-tired, gas-powered ***KRANE KAR*** works indoors/outdoors 24 hours a day!

Thousands of ***KRANE KARs*** serving Foundry, Iron and Steel Industry throughout the country. *Write for Bull. #89, "How to Cut Handling Costs."*

SILENT HOIST & CRANE CO., 885 63rd ST., BROOKLYN 20, N.Y.

(Continued from page 454)

world-wide service of products and free technical advice covering all phases of foundry work in all ferrous and nonferrous metals. Diagnosis of casting troubles and advice on problems is free and is reportedly used by foundrymen everywhere. A list of products also is included.

For More Details Circle No. 173—Page 397

HAND PYROMETER: General Electric Co., Schenectady 5, N. Y.—Information on the uses and applications of a hand pyrometer which measures temperature of any surface, liquid, gas or molten metal from 0 to 1500°F can be found in bulletin GEA-6020.

For More Details Circle No. 174—Page 397

CLAMPS: Cincinnati Tool Co., Norwood, Cincinnati 12—Catalog C-50 furnishes selection and application information on variable pressure spring clamps, general purpose carriage clamps, regular, medium, and heavy deep reach clamps, light duty joiners, hand screws, four-corner miter frames, heavy duty deep reach bar clamps, positive lock bar clamps, pipe and wood mounted clamp fixtures, chisels, punches and other tools.

For More Details Circle No. 175—Page 397

METALWORKING TOOLS: Delta Power Tool Division, Rockwell Mfg. Co., 400 North Lexington Ave., Pittsburgh 8—Condensed folder catalogs all the company's tools designed principally for the metal-working industry. The piece unfolds so that the illustrated tool descriptions and specifications can be used as a wall chart.

For More Details Circle No. 176—Page 397

HARDNESS TESTERS: Steel City Testing Machines Inc., 8817 Lyndon Ave., Detroit 28—Complete specifications for more than a half-dozen different types of brinell hardness testers and miscellaneous accessories are presented in illustrated bulletin B 953.

For More Details Circle No. 177—Page 397

GRAY CAST IRON: International Nickel Co., 67 Wall St., New York 5—Bulletin A-174, "Development and

(Continued on page 458)

Correction

A folder issued by Penn-Rillton Co., 324 West 23rd St., New York 11, describes a dustless seacoal, chemically coated, in which fines are retained and particle size and distribution are not changed. An item describing this folder in "Trade Publications" on p. 320 of FOUNDRY for March, 1954, inadvertently stated that the fines were mechanically removed.

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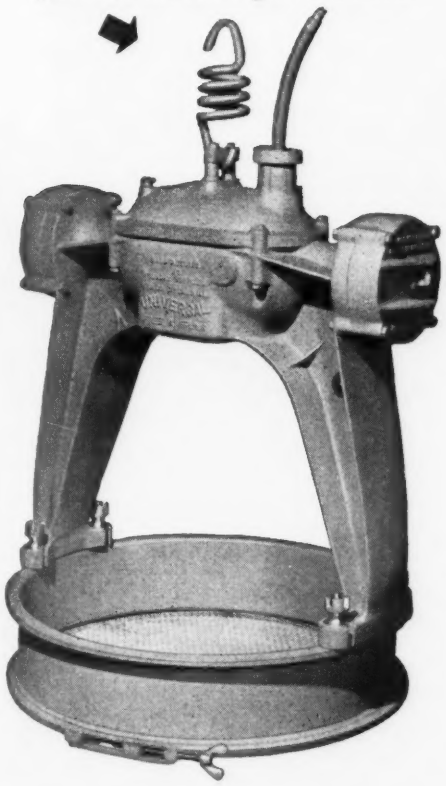
HIGH EFFICIENCY FOUNDRY TOOLS

"UNIVERSAL FREE WHEELING"

FOUNDRY SAND RIDDLE

with the Double Eight Vibration

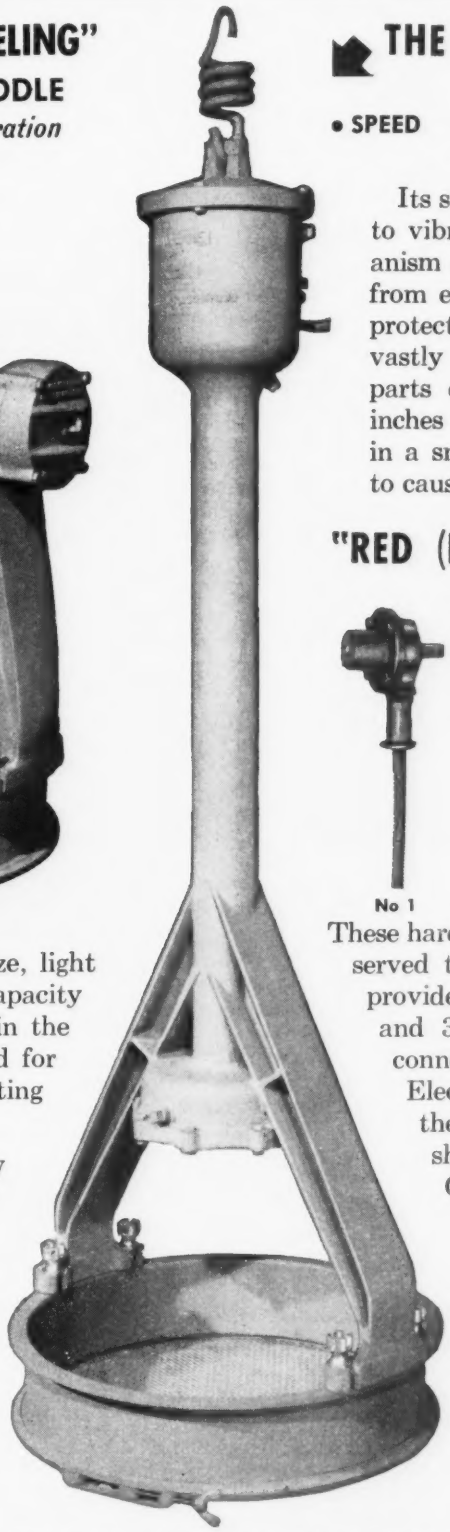


Because of its convenient size, light weight and good riddling capacity it long has been a favorite in the foundry. It also can be used for mixing core sand or for sifting sand directly into molds.

The mechanism is entirely enclosed protecting it from harmful dust and grit.

The main frame is cast in very strong tough aluminum.

It uses quick change ferruled sieves with 20 in. diameter sifting area. There are no loose wires to harm hands.



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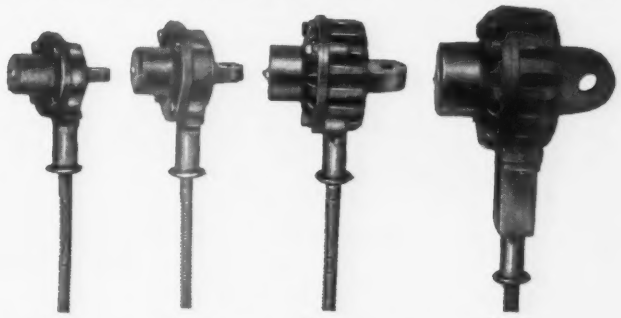
Its sturdy one-piece frame and long shaft add to vibration effectiveness. The sealed-in mechanism assures protection of motor and bearings from exposure to dust and grit. This sealed in protection and "Rotoplane's" free-rotary action vastly increase bearing life. No exposed moving parts endanger the operator. Sieves have 20 inches diameter clear sifting area—are mounted in a smooth steel ferrule with no jagged edges to cause dangerous cuts and scratches.

"RED (Devil) ELECTRIC" VIBRATORS



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These hard hitting Adams designed Vibrators have served the foundries for over 30 years. They are provided with a 6 foot 3 wire authorized cable and 3 wire grounded connector which, when connected with our 3 wire grounded Red Electric Knee Switch, automatically grounds the vibrator protecting the worker from shock. The vibrators have passed the U. S. Government code inspection.

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ABRASIVE SHOT & GRIT CO., INC.
SPRINGVILLE, N. Y.
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(*Continued from page* 456)

Control of Engineering Gray Cast Irons," includes 35 photomicrographs, charts and tables in explaining how to control both the graphite and matrix structure of gray cast iron so as to obtain superior mechanical properties. By applying proper principles, as-cast acicular iron may be produced having tensile strengths of 60,000 to 80,000 psi and up to 150,000 psi when heat treated.

For More Details Circle No. 178—Page 397

LUBRICATION PUMPS: Trabon Engineering Corp., 1814 East 40th St., Cleveland — Automatic lubrication pumps and reservoir assemblies that can be connected to any hydraulic circuit are reported in catalog A-1-54. Pumps are designed for automatic lubrication of hydraulically powered equipment such as machine tools, presses and mining machines.

For More Details Circle No. 179—Page 397

CUT WIRE SHOT: Harrison Abrasive Division, Metals Disintegrating Co., Elizabeth B, N. J.—The story of the development of cut wire shot, and suggestions as to its proper, economical use are the subject of technical bulletin 7, which offers a comprehensive treatment of the material.

For More Details Circle No. 180—Page 397

MATERIALS HANDLING: Factory Service Co., 4615 North 21st St., Milwaukee 9—Variety of illustrated applications suggests adaptability of materials handling system to a host of space and handling problems. Booklet suggests that substantial savings in finished product costs can be realized through proper materials handling systems. Many pages of ideas are offered and claimed to bring savings in labor, space and equipment.

For More Details Circle No. 181—Page 397

PAINT SELECTION CHART: Wilbur & Williams Co., 130 Lincoln St., Boston (Brighton) 35—Quick answer guide to painting maintenance problems for paint contractors, architects, maintenance superintendents, building contractors, and other users of paint, is found in the company's paint selection check chart.

For More Details Circle No. 182—Page 397

HEAT TREAT FURNACES: Holcroft & Co., 6545 Epworth Blvd., Detroit 10—Bulletin discusses four types of electric heating elements and their methods of mounting. Heat treat furnaces also are classified according to how they handle stock.

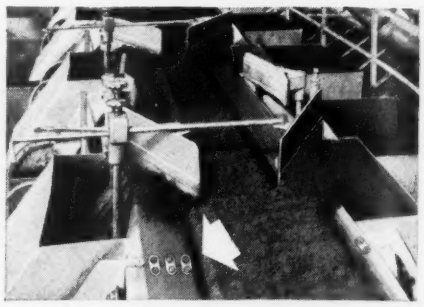
For More Details Circle No. 183—Page 397

RADIOGRAPHY: E. I. duPont de Nemours & Co., Public Relations Dept., Wilmington, Del.—Three-color booklet is a guide for x-raying such

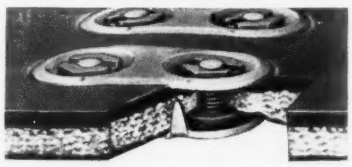
(*Continued on page* 460)

NEW! Developed Especially for FOUNDRIES

FLEXCO SCRAPER PLATES



FOR JOINING CONVEYOR BELTS WHERE SCRAPERS AND PLOWS ARE USED



- Especially designed for use in joining foundry conveyor belts.
- Beveled top plates ride snug to belt eliminating interference with plowing and scraping operations.
- Thoroughly tested . . . by several large foundries . . . for four years.
- One size . . . for joining belts 5/16" to 1/2" thick with not more than 500 ft. centers.
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Choose any style chill nail from jumbo to stubby; slim, medium, or horse nail blade; blunt, pointed, straight or 90° bent. Same types available in Stainless, Brass, Aluminum; Copper coated to order. Spider Chills, jumbo or horse nail legs—double or single. Available in various sizes and types; also made to your individual specifications. Whatever your chill job, rely on "KOOLHEAD."

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AMERICA'S LARGEST PRODUCERS OF ALLOYS

"FALLS" SPECIAL
PATTERN ALUMINUM

Better castings result when "FALLS" SPECIAL PATTERN ALUMINUM is used:

. . . more fluid than other aluminum alloys, it will run thin sections more readily.

. . . "top shrinkage" is eliminated—no soldering to build up depressed areas.

. . . since heavy gates and risers are not needed, much extra casting expense is eliminated.

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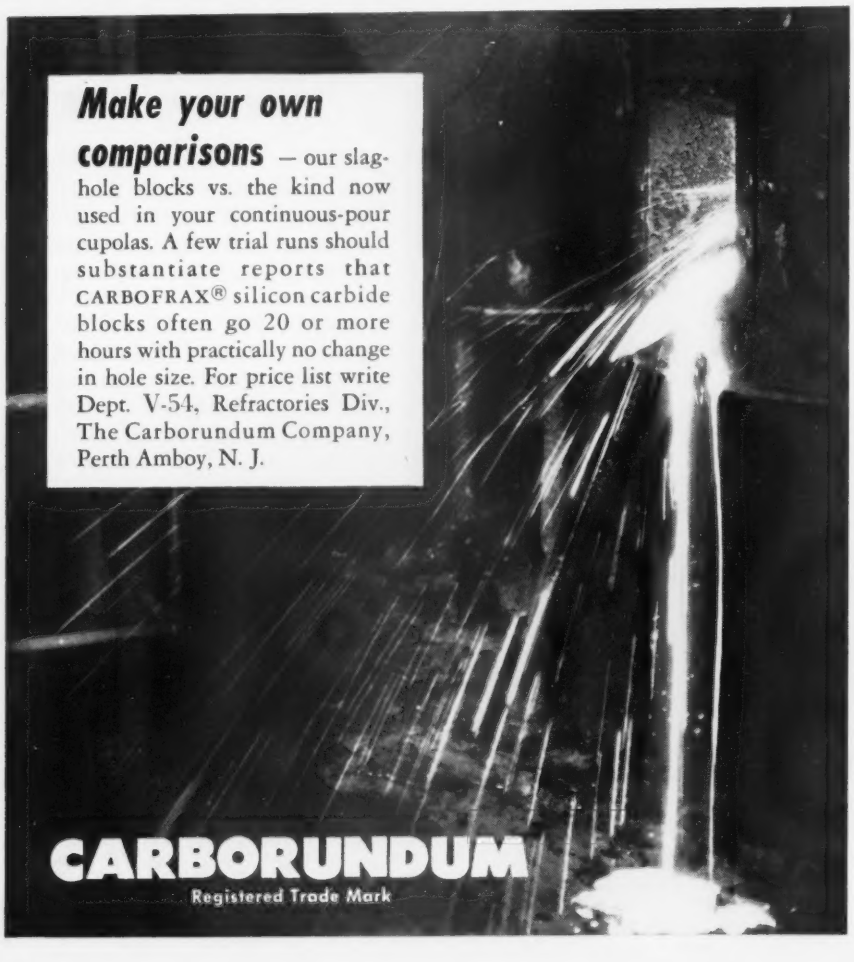
Make your own comparisons — our slag-hole blocks vs. the kind now used in your continuous-pour cupolas. A few trial runs should substantiate reports that CARBOFRAX® silicon carbide blocks often go 20 or more hours with practically no change in hole size. For price list write Dept. V-54, Refractories Div., The Carborundum Company, Perth Amboy, N. J.
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(*Continued from page* 458)

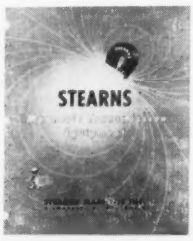
metals as steel, magnesium and aluminum with recommendations as to type of film and exposure for each. The booklet provides exposure and processing data for each of the company's films used in industrial radiography.

For More Details Circle No. 184—Page 397

SOLENOID VALVES: Eclipse Fuel Engineering Co., 1001 Buchanan St., Rockford, Ill.—Construction features, operational details, specifications and prices on the company's line of solenoid valves is offered in catalog M-500-T.

For More Details Circle No. 185—Page 397

TRANSMISSION EQUIPMENT: Stearns Magnetic Inc., Milwaukee 46—Magnetic brake and clutch bulletin 226-C provides reference data for figuring transmission equipment for individual applications. Illustrations, descriptions, diagrams, dimensions, capacities, horsepower and torque ratings on the company's clutches, brakes and clutch-brake combinations are presented. Magnetic transmission equipment is available in standard, dust-tight or explosion-proof enclosures. Rectifiers can be supplied for conversion of alternating current where needed.



For More Details Circle No. 186—Page 397

BELTING: Boston Woven Hose & Rubber Co., Box 1071, Boston 3—Company's line of rotocured transmission, conveyor and elevator belting is pictured in color catalog and tabulated as to specifications, type of construction and recommended use. A section is devoted to the formulas and rules used in estimating horsepower requirements for belting.

For More Details Circle No. 187—Page 397

FIREBRICK: Ironton Fire Brick Co., Ironton, O.—Bulletin 103 offers tabular data, diagrams and photographs about a volume-stable refractory with resistance to spalling, good loadbearing strength, and stamina to withstand alkaline dusts, ash flux action and oil penetration.

For More Details Circle No. 188—Page 397

ELECTRIC OIL HEATERS: Hauck Mfg. Co., 124-126 Tenth St., Brooklyn 15, N. Y.—Capacity ratings of the company's line of electric oil heaters for sizes from 2 up to and including 64 kw are presented in catalog 709A.

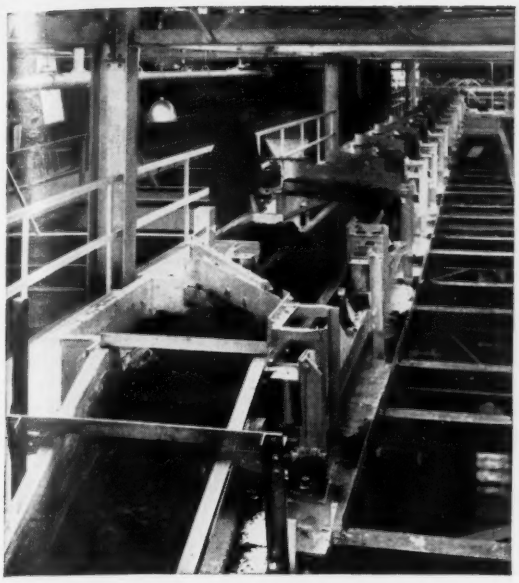
For More Details Circle No. 189—Page 397

STRAIN GAGE: Baldwin-Lima-Hamilton Corp., Philadelphia 42 — Bulletin 4207 explains the features and specifications of a hand type, dial micrometer strain gage for 2-in. and 10-in. gage lengths.

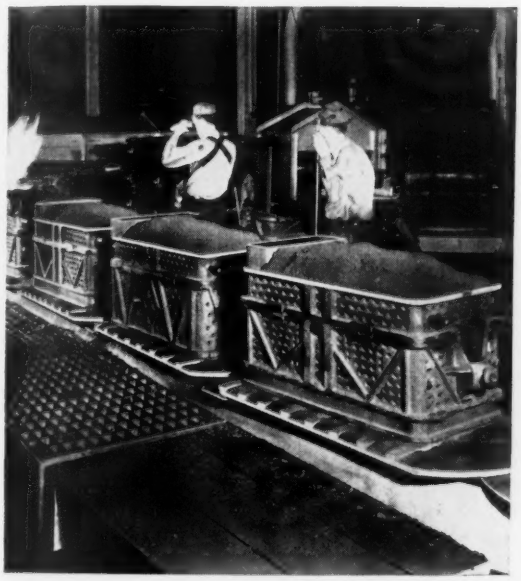
For More Details Circle No. 190—Page 397

MANLIFT ELEVATOR: Humphrey Elevator Co. Inc., Faribault, Minn.—Bulletin HB-54 illustrates a complete

(*Concluded on page* 462)



Mulled sand to moulding hoppers with P-B precision made "Lubricated for Life" Belt Idlers.



Typical custom made P-B mold conveyor for heavy castings.

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The majority of the largest, highest speed, most efficient foundries in the world rely on Palmer-Bee Conveyors.

WHY? . . . Because they are rugged, efficient and are designed for foundry service . . . not equipment adapted from some other service.

Anyone who has used Palmer-Bee equipment in a foundry, LARGE or SMALL, knows that it was designed to operate in adverse conditions and that it is *dependable*.

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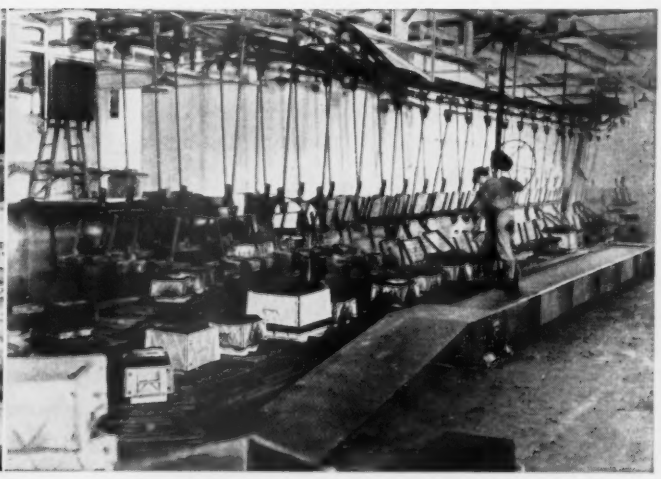
Apron Conveyor with "Lubricated for Life" ball bearing chain to handle sand and castings to shakeout.



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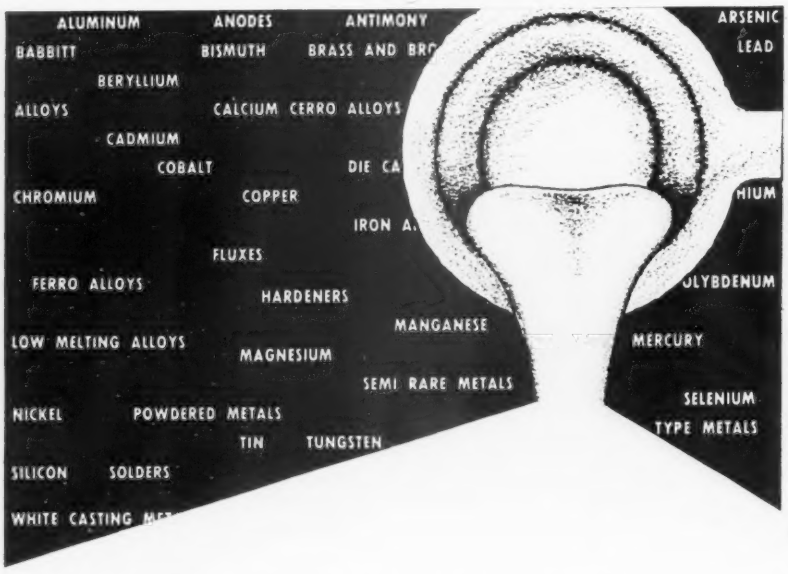

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(*Concluded from page* 460)

line of manlift elevators for use in multifloor buildings where there is vertical processing of products and/or where frequent, quick inspection of machinery on various levels is required.

For More Details Circle No. 191—Page 397

BAND SAWS: W. O. Barnes Co., Inc., 1297 Terminal Ave., Detroit 11—Hard edge flexible back band saws are made for general purpose cutting on all contour and cut-off band saw machines. Manufacturer claims teeth are accurately milled, set, and perfectly hardened to make the blades ideal for high production or intricate die sawing. Folder also contains specification and packaging information.

For More Details Circle No. 192—Page 397

MOLDING MACHINES: Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh 22—Two-color catalog features the company's complete line of molding machines, including 750 and 1500-lb jolt rollover machines, vertical hydro-centrifugal casting machines, indexing machines and others. Eleven machines are prominently displayed and their operation clearly explained.

For More Details Circle No. 193—Page 397

CONVEYOR BELTS: Hamilton Rubber Mfg. Corp., Mead & Lever Sts., Trenton 3, N. J.—Full page photographs of typical installations, informative technical data and practical illustrations tell you about belt covers, breaker fabric, rubber friction, skim coat, and reinforced rubber edges to assist you in solving your conveyor belting problems.

For More Details Circle No. 194—Page 397

VACUUM SYSTEMS: U. S. Hoffman Machinery Corp., 105 Fourth Ave., New York 3—Full range of vacuum cleaning equipment, stationary and portable, with accessories is described in bulletin A-939. The basic working elements of the company's permanently installed vacuum system with central dust collection is presented in detail.

For More Details Circle No. 195—Page 397

BLAST ACCESSORIES: Pangborn Corp., Hagerstown 2, Md.—Specifications and engineering data on helmets, gloves, hoses, nozzles, aprons, blast room accessories and repair parts and several pages of data on correct selection of abrasives are included in 28-page bulletin 300C.

For More Details Circle No. 196—Page 397

VIBRATING SCREEN: Deister Concentrator Co., 901-935 Glasgow Ave., Ft. Wayne, Ind.—Bulletin 15-J on heavy duty no blind vibrating screen presents information on construction, performance and general specifications. Photos, diagrams and cut-away drawings are included.

For More Details Circle No. 197—Page 397

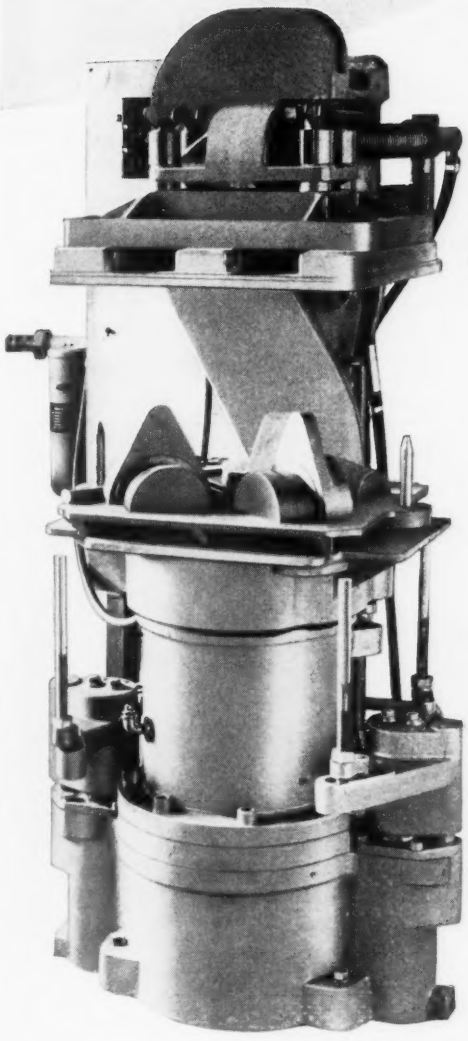
MELTING FURNACE: Lindberg Engineering Co., 2450 West Hubbard St., Chicago 12—Bulletin 29 contains photographs, diagrams, specifications, performance and other technical data on oil or gas fired, low-pressure air melting furnaces.

For More Details Circle No. 198—Page 397

Foundrymen

Savings never possible before are now open to you...

TABOR'S NEW SIMULTANEOUS Jar-Squeeze Flask Lift Molding Machine



Here's a molding machine that jars and squeezes *simultaneously*, can be *automatically controlled*, and is *shockless!*

Total time required from rolling on a flask to striking off a finished mold requires *only* 10 to 15 seconds, even when the flask is deep and the mold is difficult.

This operating speed promises you stepped-up conveyor line production, while completely automatic control offers uniform molds and less physical work for molders. And because the machine is shockless, it requires no foundation . . . can be set up entirely above the floor, even on an iron grid over a conveyor belt sand return system.

Other advantages include maximum sand packing in a very short period, guide pins adjustable for different box sizes, or rolling-on or rolling-off devices for the flasks.

Picture what this new Tabor machine will do for your foundry operations in terms of higher production and lower operating costs. Then write, wire or 'phone for full details today!

SEE US AT CLEVELAND! *Visit Booth 1230, where you'll see the new Simultaneous Jar-Squeezer and other Tabor foundry equipment leaders!*

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Snyder Foundry Supply Company, Los Angeles, Calif.; The Pacific Graphite Company, Inc., 40th & Linden Sts., Oakland 8, Calif.; Carl F. Miller & Company, Seattle, Washington; Harry H. Reich, Trussville, Ala.

FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION INC. MEMBER FEMA

The TABOR *Manufacturing Co.*

SINCE 1884 MANUFACTURERS OF FOUNDRY MOLDING MACHINES • OUR SEVENTIETH YEAR

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EXPORT DEPARTMENT, 751 DREXEL BLDG., PHILA. 6, PA.

VISIT OUR BOOTH 808
FOUNDRY SHOW
CLEVELAND

Can you name an operation that will save as much for you as weighing?

It's good business to watch weights closely! Check at receiving, shipping, production stages without delaying handling.

Put a stop to paying for dunnage, inaccuracies, other's miscalculations that rob you of your profit. Weigh loads as you lift them to move them by crane or hoist. Speed inventories, eliminate labor and equipment tie-ups at the weighing station.

Thousands of HYDROSCALES are at work in large and small plants all over the country.

The cost of weighing has been reduced to a minimum by—

HYDROSCALE

HYDRAULIC CRANE SCALE

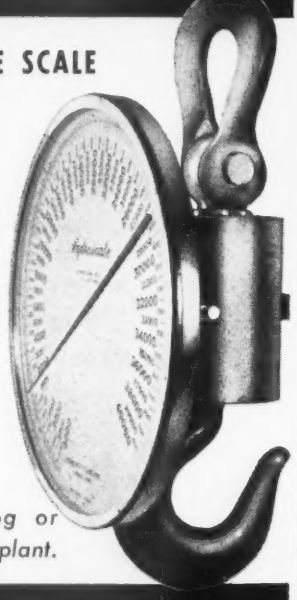
36 models
500-200,000 lbs.

12", 24", 30" dials

Tilt face models for high level reading

Combined reading kilogram-pound dials

Batching models indicate pour-off



Write for our catalog or demonstration in your plant.

HYDROWAY SCALES, INC.
20624 WEST 8 MILE ROAD · P O Box 4754 · DETROIT 19 MICH.

Use **Atlantic Fluxes** for

BETTER ALUMINUM CASTINGS

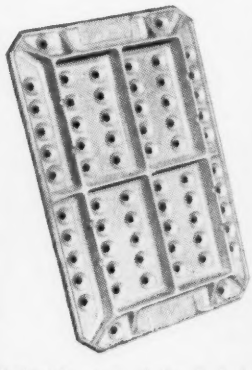
ALUCO For degasifying and purifying aluminum and aluminum alloys (sand casting). Assures uniformly sound, dense grained castings. Used in Reverberatory, Electric and Crucible type furnaces. For dissolving and removing oxides. For increasing fluidity.

ALUCO S Specially designed for die casting aluminum base metal and permanent mold castings. For reducing oxidation. For minimizing rejections. For producing sound castings.

ALUCO GR & DG For grain refining aluminum and its alloys. For degasifying aluminum.

Atlantic Chemicals & Metals Co.

1921-27 N. KENMORE AVE.
CHICAGO 14, ILL., U.S.A.



Underside view of the R & J aluminum-cleat bottom board. Both this and the R & J wood-cleat board are used by Zenith Foundry, West Allis, Wisconsin.

And Here's Why Zenith Foundry Co. Uses R & J Aluminum Bottom Boards—

1. No heavier than wood—but won't char, smoulder, or burn like wood.
2. Much cheaper than magnesium—and won't fuse.
3. R & J's are scientifically designed for extra strength, and properly vented for gas release.
4. R & J's are pound for pound less expensive than flimsier competitive brands.
5. R & J's stand up year after year.

R & J Aluminum Bottom Boards can be custom-made to meet YOUR particular requirement or design. For full details—price list—quotations, contact:

R & J Foundry Co. 610 South 94th St. Milwaukee 14, Wis.

NOW! POSITIVE MOISTURE REMOVAL

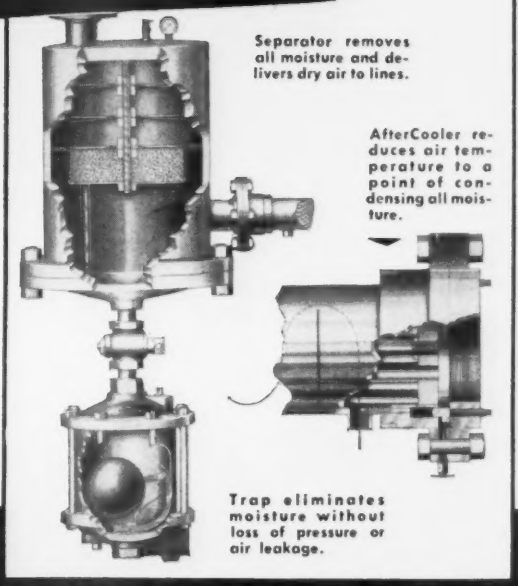
FROM COMPRESSED AIR LINES WITH THE

MURPHY AFTERCOOLER SYSTEM

The Murphy AfterCooler System guarantees the elimination of water in all compressed air line installations. Installation is simple and unit requires a minimum of maintenance. For cool, clean, dry air . . . for eliminating "down time" in compressed air operated tools and equipment . . . install a Murphy AfterCooler System in your plant now!

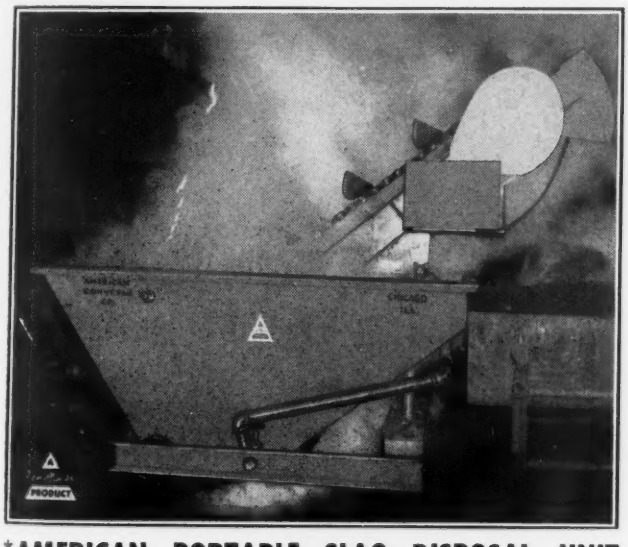
Write today for Bulletin No. 1, outlining complete details on the Murphy AfterCooler System!

GUARANTEED COMPRESSED AIR PRODUCTS
AFTERCOOLERS • SEPARATORS • STRAINERS
TRAPS • SPRAY GUNS • PISTOL SPRAYERS


Separator removes all moisture and delivers dry air to lines.
AfterCooler reduces air temperature to a point of condensing all moisture.
Trap eliminates moisture without loss of pressure or air leakage.

JAS. A. MURPHY & CO. INC.
1421 HIGH STREET • HAMILTON, OHIO

APSDU* PROMOTES SAFETY SAVES MANPOWER HOURS



***AMERICAN PORTABLE SLAG DISPOSAL UNIT**

Check these *10 good reasons* why every foundry should own this Slag Disposal Unit:

- √ Eliminates expensive waterpits
- √ No troublesome recirculating pumps
- √ Safest method for handling dangerous hot slag
- √ Eases foundry's most undesirable task
- √ Saves many hours of manpower
- √ Low cost
- √ Pre-engineered
- √ Packaged unit
- √ Compact and rugged
- √ Alternate between cupolas

See Us In Booth 1509, Foundry Show, May 8-14, Cleveland, Ohio

Phone or write for details on this important equipment!

AMERICAN CONVEYOR CO. 1117 W. ADAMS ST. CHICAGO 7, ILL.

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PHILADELPHIA COKE COMPANY

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FOUNDRY • METALLURGICAL

INDUSTRIAL COKE

PRESSURE MATCH PLATE CO., INC.

Philadelphia 23, Penna.

"SERVING DELAWARE VALLEY, U.S.A."

ALUMINUM PRODUCTION PATTERN EQUIPMENT UP TO 56" x 74"

ready for immediate use, pressure cast by the plaster process method

PLATES FOR SHELL MOLDING ★ COPE & DRAG PLATES
MATCH PLATES ★ GANG CORE BOXES ★ DRYER PATTERNS
PATTERN CASTINGS *accurately duplicated from your master or blueprint. Let us help you get better castings at less cost. We solicit your inquiries. Layout sheets available.*

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SUCCESSFUL FOUNDRIES EVERYWHERE

ARE SAVING MONEY WITH

SAFCO Core Oils...

★ LOWER CORE AND CASTING LOSSES
★ REDUCE SHAKE-OUT TIME AND LABOR
★ CUT CLEANING ROOM COSTS
★ DECREASE BAKING TIME
★ REDUCE CORE GAS AND SMOKE
★ ELIMINATE CORE-BOX STICKING

Foundries of every type and size are cutting losses and saving money by putting a SAFCO core oil to work for them. In the comprehensive SAFCO line there is the correct oil to fit your foundry practice and give outstanding performance...

WRITE FOR FREE LITERATURE — TODAY!

OIL PIONEERS FOR OVER 100 YEARS

SWAN-FINCH OIL CORPORATION

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Prime-Mover in background with bucket for hauling sand and other loose bulk. The unit in foreground has platform loaded with 100 lb. sacks of binder. Bucket and platform quickly interchangeable.

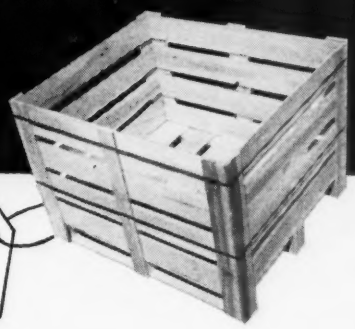
This foundry tried one Prime-Mover —and now has 3 of them!

Dodge Steel Company, Philadelphia, has a major handling problem hauling materials from storage to foundry bins. Mr. Charles Wellens, maintenance engineer at Dodge, says: "Our first Prime-Mover has been in operation over a year. We have had no maintenance on it except to adjust the clutch once. This is good performance when you consider the abrasive material present in a foundry. The two other units were added later after we became certain we could save money by using Prime-Mover." May we tell you more about Prime-Mover for your own plant?

THE PRIME-MOVER COMPANY
MUSCATINE, IOWA

THE Bell PRIME-MOVER

Throw-Away PALLET BOXES



40" x 48" x 27" high
3000 lbs. capacity
LESS THAN $4.00 F.O.B.

SAVE WEIGHT
SAVE FREIGHT—COSTS LESS, TOO

Do away with the nuisance of high-cost returnable pallet boxes. Combined cost of this wooden pallet box and the freight to ship it is less than the freight alone on a returnable metal box. Saves you cost—saves your customer the trouble of returning it. Also other types of standard and special wooden pallets. Write for full details.

WOOD FABRICATING CO.

3762 WYOMING — DEARBORN, MICHIGAN

CENTRIFUGALLY CAST

AUTOMOBILE CYLINDER LINERS

DIESEL ENGINE LINERS

BRONZE BUSHINGS

on the new
WATER-COOLED
Model M-WC
(Illustrated)

Utilizes low cost permanent molds of available steel tubing to produce gray machinable cast iron or bronze bushings.

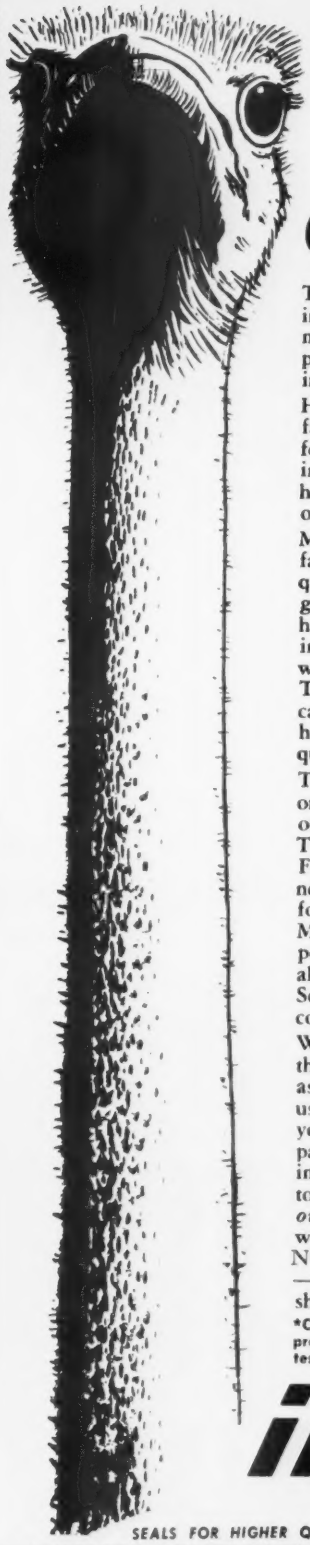
Water cooled molds can be maintained at either high or low temperature easily. High or limited production in very small space with unskilled labor. Completely safe for workmen. Simple, sturdy equipment. Quick changeover from one mold to another. Practically 100% metal yield of high quality, denser castings. Metal porosity eliminated.

Write for new Bulletin # 153 Illustrating Model M-WC

RESEARCH FACILITIES

We have available an Experimental Foundry equipped for ferrous and non-ferrous melting for both vertical and horizontal centrifugal casting production. Our facilities are available to foundries for research or trial centrifugal castings at low cost.

Centrifugal Casting Machine Co.
P. O. Box 947 — Tulsa 1, Okla.



Are you a Foundry Ostrich?

This stubborn bird hides his head in green sand every time someone mentions impregnation sealing of porous* castings. Doesn't believe in it!

He just won't look the facts in the face—even when those facts are that for hundreds of companies modern impregnation methods and materials have substantially licked the problem of porosity in pressure castings!

Many of these companies carry famous names—wouldn't endanger quality or reputations for all the gold at Fort Knox. So what's happened? Using the new impregnation methods and materials we've been able to develop at Tincher, they've cut rejects of castings to the lowest level in their history! And they haven't lowered quality by a hair's breadth!

This kind of experience points up one thing: Impregnation has "come of age"—quite largely because of Tincher research and development. For instance, right now we have new but thoroughly field-proven formulas for Tincher IMPREX Metallic Sealants that insure deep penetration and positive sealing. We also have a new IMPREX Plastic Sealant that permanently cures very coarse porosity—even "squirters".

We'd like you to make us *prove* that we can eliminate porous castings as a problem in your plant. Send us a sample batch of castings that you have found to be porous. We'll pay the shipping costs both ways—impregnate them and return them to you. *You test 'em, under your own conditions*—see for yourself whether we can do what we say. NO OBLIGATION WHATSOEVER—but do it now! Send coupon for shipping instructions.

*Castings that must withstand liquid or air pressures and which have been rejected after tests as "leakers".

TINCHER IMPREX PROCESS

SEALS FOR HIGHER QUALITY, MORE PROFITABLE PRODUCTION

TINCHER PRODUCTS COMPANY, 840 Borden Ave., Sycamore, Ill.

Please send shipping instructions for my sample batch of castings consisting of _____ pieces. They weigh about _____ each and are _____ (give approx. dimensions) in size.

Name _____

Title _____

Company _____

Street _____

City _____ Zone ____ State _____

TWO SIMPLE REASONS WHY!

● We will guarantee—in writing—that you'll save money on your blast cleaning costs when you use Permabrasive* shot and grit instead of conventional annealed abrasives. Yes sir, a guaranteed savings in writing.

We can afford to make this statement, because Permabrasive shot and grit are better. They are better for two simple reasons: (1) Permabrasive is made from metal of the proper analysis. Its carefully controlled chemical composition insures uniform response to heat treatment and maximum resistance to breakage. (2) Permabrasive is heat treated properly. A continuous processing method insures complete heat treatment of each abrasive particle, resulting in a high degree of uniformity and assuring maximum abrasive durability.

Permabrasive will save you money and we can prove it. Write the nearest Hickman, Williams office for proof and a complimentary copy of "A Primer on the use of shot and grit."

*Licensed under U. S. Patent No. 2184926, U. S. Application No. 619602

PERMABRASIVE* SHOT AND GRIT IS *PRODUCED EXCLUSIVELY BY*

THE NATIONAL METAL ABRASIVE CO.
CLEVELAND, OHIO

AND SOLD EXCLUSIVELY BY

HICKMAN, WILLIAMS & CO.
(INCORPORATED)
CHICAGO • DETROIT • CINCINNATI • ST. LOUIS • NEW YORK
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Master Power
HARD CHROMED • PORTABLE PNEUMATIC TOOLS

DO MORE WORK AT LESS COST
because they deliver more power per cubic foot of air consumed, are light in weight for easier maneuverability and they retain their new tool power longer.

ARE PREFERRED BY OPERATORS
because they are lighter in weight, better balanced and designed to reduce shock and be free from vibration.

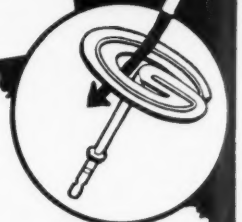
IF YOUR PROBLEM INCLUDES
chipping, ramming, grinding, buffing, sanding or wire brushing, *write us today for full particulars.*

THE MASTER PNEUMATIC TOOL COMPANY, INC.
ORWELL, OHIO • U. S. A.
SALES • SERVICE • STOCK • COAST TO COAST

Where a Hole Counts

The Open Head of the Cleveland Coil Head Radiator Chaplet makes it easy to pack sand solidly under head and around the stem. This ensures better support for the chaplet, more rigidly held cores — reduced castings rejects.

•SAND PACKS BETTER

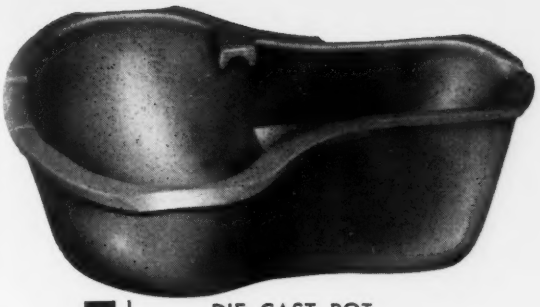


WRITE FOR BULLETIN showing our line of Coil Head and Square Head Radiator Chaplets, also Motor, Boiler, Forged Head, Fitted Head, Double Head and other types.

CLEVELAND CHAPLET & MFG. CO.
26470 Lakeland Blvd., Cleveland 22, Ohio

Patented

CLEVELAND Chaplets
Since 1890



DIE CAST POT

THEY STAND THE HEAT!

ACME { MELTING POTS
DIE CAST POTS
INGOT MOLDS

. . . for Melting Nonferrous Metals

Made of Special Formula Cast Iron

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Write for Data Sheet on 40 Sizes

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ACME FOUNDRY COMPANY
2502 22nd St.
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SPOUT POT
NO. 550A

HOLDING BOWL
NO. HP7001

GRAY IRON FOUNDRIES
Simplify Chill Control . . .

with

TELLURIUM

Available in 1, 2, 3, and 4-gram tablets; also in powder, slabs and sticks. For full information, write Dept. LM for 16-page article on the use of TELLURIUM in chill control.

American Smelting and Refining Company
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You get all 4 →→→ SAFETY — ECONOMY — DEPENDABILITY — LONG LIFE!

with **TAYLOR MADE**
the only complete line of
ALLOY STEEL CHAIN
because...

- Taylor Made Alloy Steel Chain has twice the tensile strength (125,000 lbs. P.S.I.) of wrought iron chain (48,000 lbs. P.S.I.)!
- This famous nationally advertised chain is heat-treated—never requires annealing!
- It has tremendous resistance to shock, grain-growth and work-hardness at all temperatures!
- All slings are furnished with amazing new Taylor Made Alloy Steel Tayco Hooks!
- Rings, joiner links and other sling attachments are of the same analysis, heat-treated alloy steel as the chain.

S. G. TAYLOR CHAIN CO., Hammond, Ind.

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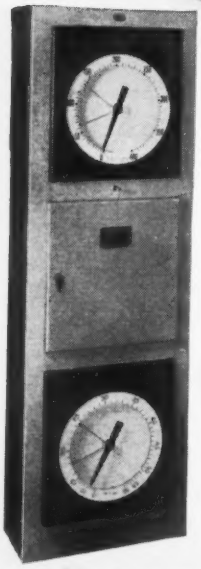
S.G. Taylor Chain Co.
Dept. 18 Hammond, Indiana
Rush free copy of Booklet No. 12C giving all the facts and specifications on Taylor Made Alloy Steel Chain!

Name_____

Address_____

TAYLOR MADE
A GREAT NAME IN Chain SINCE 1873

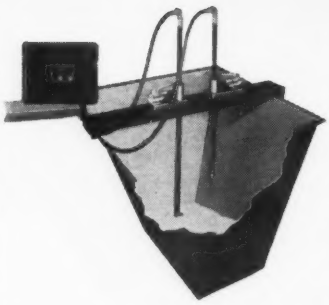
AUTOMATIC SAND TEMPERING



The Automatic Sand Tempering Unit adds the exact amount of tempering water to any type of sand in any type of sand mill.

RESULT Constant Moisture—Saves labor—Improves ease of molding—Saves castings.

AUTOMATIC SAND PLOW



The Hoppertrol Unit automatically raises and lowers the sand plow depending on sand level in center of the bin or hopper.

RESULT Saves labor—Removes men from dusty locations. Sand distribution may be programmed.

HARRY W. Dietert COMPANY

CONTROL EQUIPMENT
SAND · MOLD · MOISTURE
CARBON · SULFUR

9330 ROSELAWN AVE. • DETROIT 4, MICHIGAN

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Chemists—Metallurgists
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SERVING THE FOUNDRY INDUSTRY SINCE 1907
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RETORTS, GRAPHITE SHAPES
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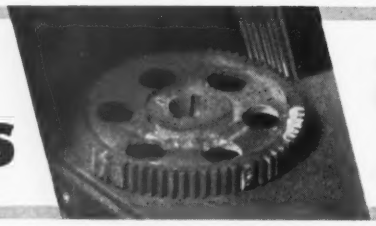
TEL. TAUNTON 4-5121

SALVAGE CASTINGS



with MARQUETTE
NICOL-ROD No. 44
Cast or Malleable Iron
Machineable . . . without Preheating

Worth its weight in gold for repairing defective castings, castings sand pockets, machining errors, etc.

Marquette Manufacturing Co., Inc. 307 E. Hennepin Ave. Minneapolis 14, Minn.

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10 GRADES OF WASHED, DRIED, SCREENED

SILICA FOUNDRY SANDS

Produced from celebrated Ottawa District St. Peter Sandstone • Rounded Grains
Steel Molding Sand • Core Sand • Blast Sand • Furnace Bottom Sand
Opener Sand • Sand for Non-Ferrous, Aluminum, Magnesium Castings
MICROSIL Ground Silica (5 Grades of Uniform, Pure White Silica Flour)

MICROSIL GROUND SILICA

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DISTRIBUTORS IN ALL PRINCIPAL CITIES

BLACKHAWK SILICA SAND

DON'T MISS—

The Belmont

SUPERSONIC NOZZLE

at the FOUNDRY SHOW

CLEVELAND — May 8-12

See for yourself—under actual blasting test conditions—how this revolutionary new SUPERSONIC NOZZLE produces 25% MORE WORK without increased use of air or abrasive.

Look for the Belmont SUPERSONIC NOZZLE demonstration at Booth 1510.

VACU-BLAST CO., INC.

BELMONT, CALIFORNIA

Quick Clean Release for **SHELL MOLDS**

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SILICONE BOMB SEPARATOR

SHELL MOLDERS! CHECK THESE FEATURES

- ✓ Wets and adheres to all metal surfaces.
- ✓ Does *not* affect permeability of shells.
- ✓ Will *not* form carbonaceous deposits.
- ✓ Completely stable at all molding temperatures.

PRICES

Sample Can	$ 2.00
Unbroken dozen	18.00
Unbroken gross	197.40

Minimum Freight Allowed

Further discounts on larger orders.

INJECTION MOLDERS SUPPLY CO.

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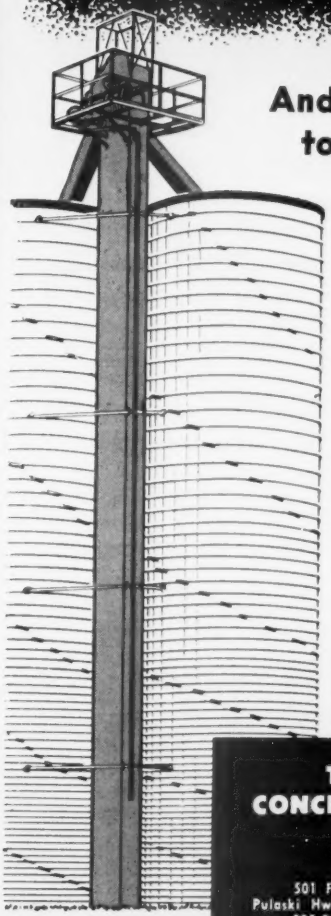
store core sand right... in MARIETTA CONCRETE SILOS



And Open Your Eyes to Greater Profits

Make more efficient use of foundry floor space! Relocate sand storage in modern MARIETTA concrete stave silos. These silos take valuable core sand off the floor, outside the building, and put it up in the air, out of the way where it is always readily accessible. MARIETTA silos protect sand from moisture and freezing, keep it in a ready-to-use condition, give better inventory control. When equipped with mechanical loaders and unloaders, they can cut handling costs to a low 4c per hp, from $10 per hp for manual labor. Write for catalog.

THE MARIETTA CONCRETE CORPORATION

MARIETTA, OHIO

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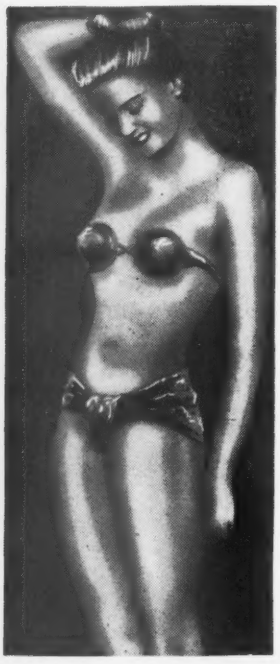

. . . IT'S NOT THE SAME

inside

RADIOGRAPHY shows that the "inside" of a casting or forging also looks different from the outside.

In fact, that's true of a lot of things. For instance, many Radiographic laboratories look the same on the outside but it's the knowledge, experience and expert technique of the "inside" personnel which makes the difference.

Here, at INDUSTRIAL X-RAY, Inc. our highly trained, experienced staff of Engineers and Technicians are on hand . . .at all times . . . to give you interpretive X-Rays. Advice too, when you ask. Our motto is "service". . . our charges are moderate.

We'd like to tell you a little more . . . phone, write or see us at Booth #110 at the Show.

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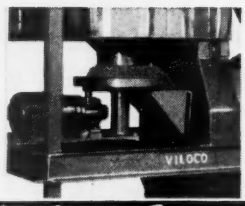
W. Hempstead, N. Y.
Phone: HEmpstead 7-5252

Viloco ROTARY SAND DRYERS

DIRECT HEAT DRYING • FAST AND ECONOMICAL
DELIVERS 2½ TO 3 TONS DRY SAND PER HOUR
OIL OR GAS FIRED

The VILOCO Rotary Sand Dryer feeds, dries and screens automatically. With wet sand hopper filled, burner operating and drum revolving, sand emerges thoroughly dried and screened, ready for use. Every unit of heat is utilized to dry the sand, resulting in faster and more efficient delivery of dry sand.



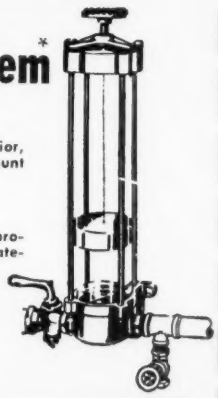
Cut Costs in Foundries

New! A compact unit for ideal sand preparation. Quickly dries, handles sand. Only 8' long x 3' wide, 5½' high. Write for facts today.

VILOCO RAILWAY EQUIPMENT CO.
332 S. Michigan Avenue • Chicago 4, Illinois

REDUCE OPERATING COSTS with AQUADYNE

Wet Water system*



• FOR CORE SAND MIXTURES
AQUADYNE Wet Water produces a vastly superior, smoothly blended sand mix and reduces amount of core oil needed.

• FOR MOULDING OPERATIONS
AQUADYNE Wet Water spreads, diffuses and produces a faster penetration with moulding materials—resulting in sharper, cleaner castings and fewer rejections.

• FOR SAND CONDITIONING
Sand mixing is simpler, faster and more efficient. The Aquadyne System saves water, as well as time because its unusual low surface tension gives instantaneous coverage of each grain of sand it touches.

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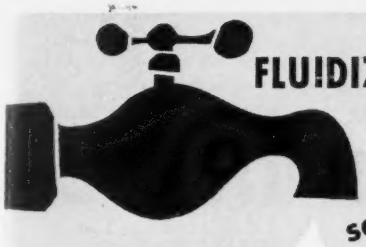

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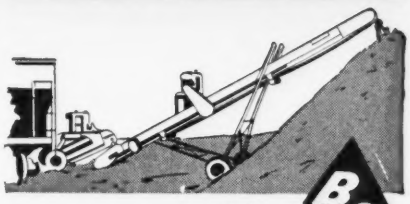

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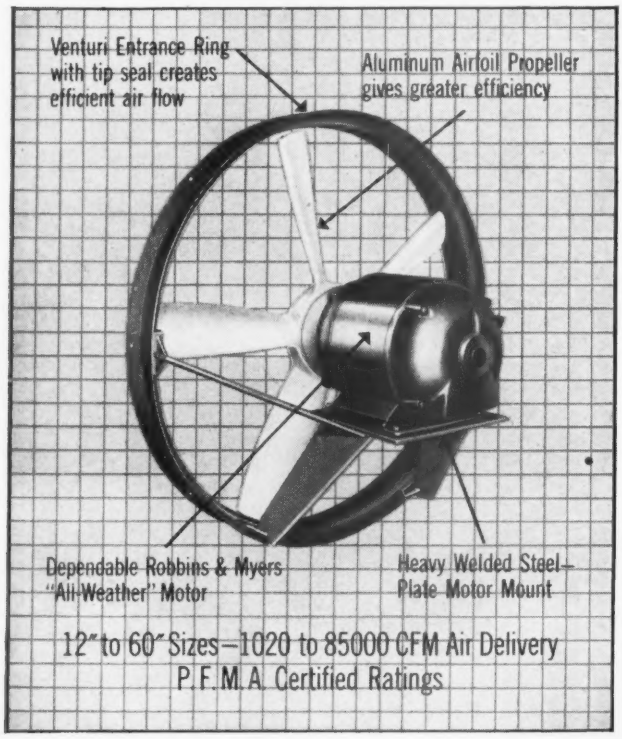
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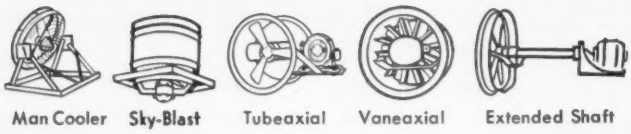

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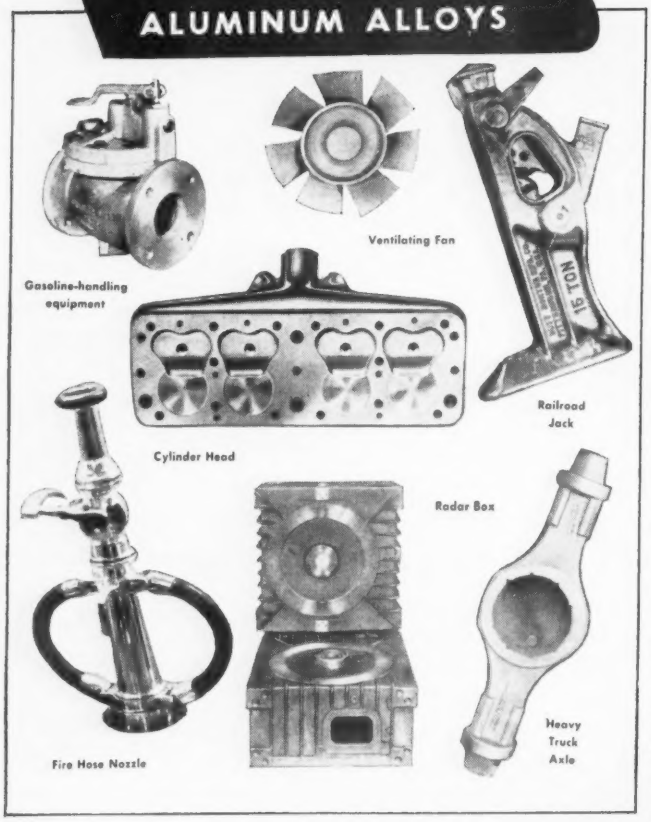

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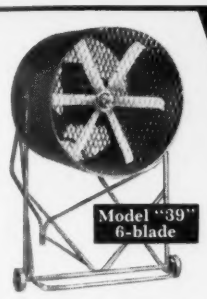

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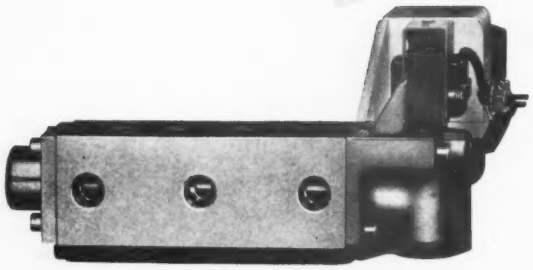

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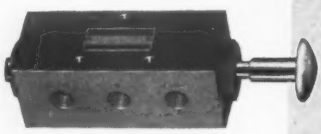

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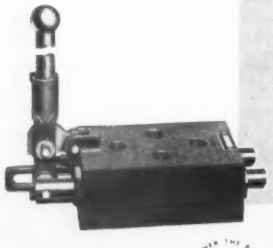

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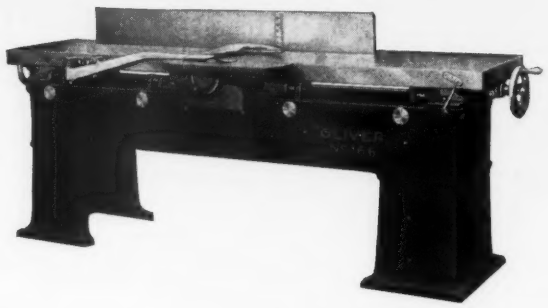

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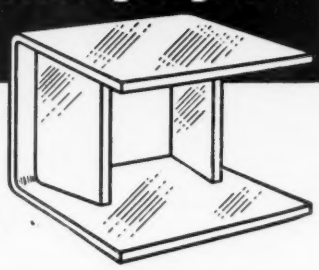

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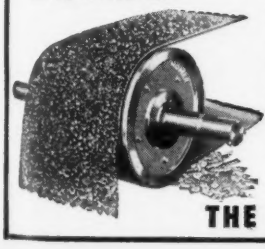

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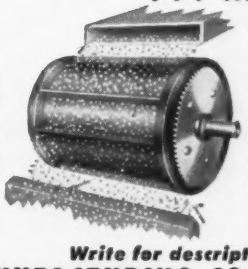

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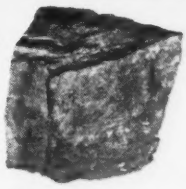

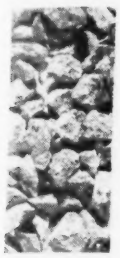

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**Names on request*

The amazing service records of TISCO Replacement Blades are the result of the special alloy and sound casting methods developed by Taylor-Wharton—specialists in wear-resistant alloys.

TISCO Replacement Blades are carefully heat-treated to a Rockwell C hardness of 65 and a diamond Brinell hardness of 700. TISCO Blades are accurately ground to gauge on all fitting dimensions, then inspected to assure maximum smoothness on the wearing surface, weighed and assembled in balanced sets.

One set will convince you!

Order a set of TISCO Blades from your foundry jobber or from us direct. Use them for your next replacement. Check their service life against the blades you are now using.

Sold by foundry jobbers throughout the United States and Canada. If your jobber has none—write us direct.

TW
Founded 1742

TAYLOR-WHARTON IRON AND STEEL CO.

High Bridge, N. J. Cincinnati, O. Birmingham, Ala. Easton, Pa.

GLUTRIN
LIQUID BINDER

GOULAC
DRY BINDER

For
CORE WORK, SAND FACINGS, SPRAYS

Write for pamphlets giving detailed information. Both materials carried in stock by America's foremost foundry jobbers

Robeson Process Company
(Established 1905)

American Gum Products Co.
(Established 1915)

GENERAL OFFICES: 500 FIFTH AVENUE • NEW YORK 18, N. Y.

CLASSIFIED ADVERTISING

Help Wanted

ASSISTANT PATTERN SHOP SUPERINTENDENT

Experience in steel foundry practice desirable. In replying give complete information which will be held in strict confidence by a single executive.

BOX 133
FOUNDRY CLEVELAND 13, OHIO

CORE DEPARTMENT FOREMAN

For progressive foundry in Indiana. Must be capable of supervising core department, 25 men, for maximum efficiency and have complete knowledge of rigging equipment for blowing cores. Age required: 30 to 50 years. Excellent opportunity for right man. Write giving full details of personal background, past experience and salary expected. Address: **NOBLESVILLE CASTING COMPANY, INC., NOBLESVILLE, INDIANA.**

WORKING FOREMAN

For core room employing 6 to 8 coremakers—all bench and blower work. Must be capable of taking full charge. State age, past experience and salary expected first letter. Plant located Iowa. Address: Box 165, FOUNDRY, Cleveland 13, Ohio.

Help Wanted

FOUNDRY FOREMAN

To take charge of molding machine production in progressive New England foundry. Require steel or alloy steel foundry experience in semi-production or jobbing shop. Excellent opportunity for right man. Write full details of experience and personal background and salary expected. All replies confidential.

BOX 148
FOUNDRY CLEVELAND 13, OHIO

SUPERINTENDENT

Superintendent of gray iron jobbing foundry located in South Central New York, pouring 15 tons per day or machinery castings up to 500". Age 50 or over preferable. Write personal data, salary desired, and resume of experience.

BOX 172
FOUNDRY CLEVELAND 13, OHIO

FOUNDRY SUPERINTENDENT

Permanent position with gray iron foundry department of old AAA-1 company. Position requires man having considerable foundry experience in molding, coremaking, melting and handling men. Foundry 10-20 ton capacity operated for company's needs of pressure tight castings, small to medium sizes. Give complete history, reference, salary expected and attach photo. Replies confidential.

BOX 157
FOUNDRY CLEVELAND 13, OHIO

EXECUTIVE WANTED

A progressive Michigan gray iron foundry capable of pouring 150 tons of castings daily, wants an experienced foundryman for sales, also to assist with management of plant. Address: Box 152, FOUNDRY, Cleveland 13, Ohio.

Help Wanted

SUPERVISOR—MANAGER FOUNDRY METALLURGIST

Established Connecticut gray iron foundry has great opportunity for young aggressive man who wants a real challenge. The man we want must be a real worker and producer and eager to be a key man in our organization. Technical man with some practical experience preferred.

BOX 178
FOUNDRY CLEVELAND 13, OHIO

PROJECT ENGINEER

For small gray iron foundry Middle West. Various non-repetitive production problems including research and development under supervision of vice president. Recent graduate foundry option Industrial Engineer with some shop experience. Replies confidential. Write full details personal background, resume of experience, references and salary expected. Address: Box 158, FOUNDRY, Cleveland 13, Ohio.

GENERAL SUPERINTENDENT

For malleable iron foundry. Applicant must have had experience in production shop. Metallurgical background desirable. Please state age and experience in reply. Must be familiar with malleable iron gating, molding technique, etc. Address: Box 135, FOUNDRY, Cleveland 13, Ohio.

Help Wanted

METALLURGIST

Metallurgist or engineer with metallurgical experience for a nonferrous precision casting foundry located in scenic central New Hampshire. Can offer all fringe benefits plus a bonus plan.

BOX 154

FOUNDRY **CLEVELAND 13, OHIO**

SUPERINTENDENT

Well-established malleable foundry offers excellent opportunity for qualified superintendent. Knowledge of mechanized operations desired. Give age, experience and salary data.

BOX 132

FOUNDRY **CLEVELAND 13, OHIO**

METALLURGIST

Physical, for work in mechanized malleable iron foundry located in Central Ohio. Degree in metallurgy preferred but not necessary, with experience in malleable iron foundry desired. Investigate properties and treatment of metals. Some knowledge of annealing and heat treating. May accept recent graduate with limited experience. Good opportunity for advancement. Address: Box 143, FOUNDRY, Cleveland 13, Ohio.

CASTINGS SALES ENGINEER

Large independent producer of ferrous castings located in Northern Illinois has opening for qualified sales engineer. This position offers a salary plus commission and is direct factory representation. No agents need apply. Must be experienced and have appropriate background in terms of education and training. Please reply, giving full particulars as to personal data and business experience. Address: Box 150, FOUNDRY, Cleveland 13, Ohio.

CLEANING ROOM FOREMAN

By foundry employing from 15 to 25 molders on light and medium weight castings. Must be experienced in all phases of cleaning room operations, capable of establishing piece work prices and able to maintain good labor relations. This is a permanent position in a good organization. In reply state age, experience, names of past employers and salary expected. Address: Box 162, FOUNDRY, Cleveland 13, Ohio.

Positions Wanted

GENERAL MANAGER

ENGINEERING DEGREE AND EIGHTEEN CONTINUOUS YEARS' EXPERIENCE AS SUPERINTENDENT EQUIP ME TO DEAL PROFITABLY WITH PROBLEMS OF PRODUCTION, LABOR RELATIONS, COSTS, ENGINEERING, MACHINING AND SALES IN YOUR PLANT. EXCELLENT PRODUCTION AND SCRAP RECORD IN GRAY, MALLEABLE, BRASS WITH FLOOR AND MECHANIZED FOUNDRY EMPLOYING 600. REFERENCES VERIFY ABOVE STATEMENTS. AGE 48. ADDRESS: Box 181, FOUNDRY, Cleveland 13, Ohio.

WORKS MANAGER OR SUPERINTENDENT

Ferrous or nonferrous, well versed in all phases of foundry procedures in jobbing and high production shops. Experienced in labor relations, production and scrap control. Now employed as plant superintendent. Prefer Western New York but is not essential. Address: Box 171, FOUNDRY, Cleveland 13, Ohio.

GENERAL FOREMAN OR FOREMAN

Practical man with 19 years supervision in nonferrous and ferrous including all phases of foundry operations, jobbing and high production. Now employed. Prefer middle west, but not essential. Address: Box 128, FOUNDRY, Cleveland 13, Ohio.

CLEANING ROOM FOREMAN

Or general foreman, 20 years' experience, both job and production also time study experience. Good with men, best references, available now, go anywhere. Address: Box 140, FOUNDRY, Cleveland 13, Ohio.

Positions Wanted

FOUNDRY EXECUTIVE
(nonferrous)

V. P. and General Manager small nonferrous foundry and machine shop handling sales, pricing, purchasing, production and labor relations. Metallurgical education and twenty years' experience as foundry and sales engineer, director of research, advertising manager and metallurgist. Broad knowledge of and experience in foundry and smelter. Desire PART TIME assignment with smelter or will consider attractive full-time opportunity in midwest. Address: Box 141, FOUNDRY, Cleveland 13, Ohio.

PRACTICAL FOUNDRYMAN

Thirty-two years' continuous jobbing foundry experience in all phases of ferrous and nonferrous casting. Knowledge includes, marine dredging, railroad, casting manufacturing, heat-treating, melting by cupola, electric arc, crucible and converter blowing, patternmaking from prints or samples of brass, iron, steel and their alloys. Past nineteen years in employ of U. S. Government at Balboa, C.Z. Returning to States April 15th, because of shops closing there. Excellent work record. Address: Box 147, FOUNDRY, Cleveland 13, Ohio.

GENERAL MANAGER

Mature, profit-minded, aggressive. Successfully managed five companies—three taken out of the red. Trained two successors, both made good. Qualified to carry complete administrative responsibility and develop all profitable possibilities. Excellent experience foundry, machinery and related lines. Address: Box 161, FOUNDRY, Cleveland 13, Ohio.

FOUNDRYMAN

Gray iron foundryman, thirty-four years' experience, seventeen years in supervisory capacity from foreman to superintendent. Broad experience in jobbing and diesel work, light and heavy, green and dry sand. Well versed in gray iron metallurgy, sand control, melting alloy irons in cupola and electric. Practical experience in molding, core making and cleaning. Supervisory experience in production, costs, quality control and labor relations. Married, age 53. Good references. Address: Box 146, FOUNDRY, Cleveland 13, Ohio.

FOUNDRY EXECUTIVE

Thoroughly experienced in the management of gray iron production or jobbing foundries. Qualified to show you a highly efficient and low cost operation. If you are interested. Address: Box 951, FOUNDRY, Cleveland 13, Ohio.

WORKS MANAGER—IRON OR STEEL

Carbon, high or low alloy. Metallurgical background, labor relations and sales experience. All around foundry experience, low scrap records, reduced production costs, increased production. References, presently employed. Address: Box 170, FOUNDRY, Cleveland 13, Ohio.

SUPERINTENDENT OR GENERAL MANAGER

If your scrap is high and your costs are up I can help you. Have always been able to get a foundry out of trouble and make a profit for the company. That is why I can make this statement. Results guaranteed or no cost to you. Have 26 years' of practical experience in all phases of foundry operation; 45 years old. Can furnish references and any other information requested. Address: Box 134, FOUNDRY, Cleveland 13, Ohio.

FOUNDRYMAN

Superintendent or general foreman. Practical man. Twenty-seven years' experience in gray iron and nonferrous jobbing and high production shops. Now employed. Western or central New York preferred but not essential. Address: Box 909, FOUNDRY, Cleveland 13, Ohio.

GRAY IRON FOUNDRY EXECUTIVE

Well versed in all phases of foundry procedures available. Molding, light and heavy. Green and dry sand. Coremaking, cupola operation, gray iron metallurgy, foundry costs, customers contacts. Thirty years foundry executive experience various capacities. Presently employed. Address: Box 994, FOUNDRY, Cleveland 13, Ohio.

WEIGHT ESTIMATING

Estimating of casting weights furnished by return mail. Accurate, reliable and confidential service. Automatic calculator equipment. Nominal fee. Send blueprints to: **CHARLES E. ROLAND, ITASCA, ILLINOIS.**

FOUNDRY EXECUTIVE

Top-flight man versed in controlled strengths, specification iron, either production or jobbing. Excellent labor and scrap record. University trained. Age 42. Address: Box 136, FOUNDRY, Cleveland 13, Ohio.

CLASSIFIED ADVERTISING

Positions Wanted

METALLURGIST

Fifteen years' experience as an all-around factory worker, plus education in Metallurgy. Tech graduate June, 1952. Experience as metallurgist since graduation includes supervision of melting departments in gray iron cupola melting and mixes, chemical and sand testing, and nonferrous, brass and aluminum. Also knowledge of foundry practices and several years actual foundry work. Prefer position where company is progressive and opportunities exist for advancement. Excellent work record—dependable and ambitious worker. Age 41. Married. Address: Box 159, FOUNDRY, Cleveland 13, Ohio.

METALLURGIST

Degree in Metallurgy, seven years experience in various phases of gray iron foundry work. Midwestern location desired. Will consider any supervisory position with a promising future. Age 35. Address: Box 125, FOUNDRY, Cleveland 13, Ohio.

FOUNDRYMAN

Manager, superintendent or general foreman. Twenty-three years' experience in all phases of foundry operations and supervision. Gray, semi-steel, Meehanite and nodular irons, green and dry sand, jobbing or high production. Age 42. Address: Box 153, FOUNDRY, Cleveland 13, Ohio.

FOUNDRYMAN

Superintendent or general foreman. Practical man, experience in aluminum and gray iron, jobbing and production. Well versed in all phases of foundry work. Married, age 45. Address: Box 160, FOUNDRY, Cleveland 13, Ohio.

FOUNDRY FOREMAN

With wide practical experience on all kinds of light and medium castings including stove plates. Well versed in cupola operation. Prefer foundry with 25 to 35 molders. Middle aged, employed at present. Desire change to warmer climate. Others do not answer. Address: Box 111, FOUNDRY, Cleveland 13, Ohio.

FOUNDRY METALLURGIST SUPERVISOR

Degree in metallurgy plus a four-year foundry apprenticeship. Considerable experience dealing with nonferrous foundry problems and some supervision. Desire position in a technical or supervisory capacity. Age 30. Address: Box 997, FOUNDRY, Cleveland 13, Ohio.

MANAGER OR SUPERINTENDENT

Forty-three year old executive. Technical and practical experience in heavy jobbing and light production iron foundries. Capable and progressive; 18 years in supervisory capacities. Address: Box 175, FOUNDRY, Cleveland 13, Ohio.

WANTED

By ex-foundryman with many years of experience, position as "sales engineer" with foundry supply company. Address: Box 163, FOUNDRY, Cleveland 13, Ohio.

MASTER MECHANIC

Experienced in all phases of machine shop work, plant and equipment maintenance, have successfully developed preventive maintenance programs. Ability to handle men, over ten years' supervisory background. Married, age 37. Address: Box 180, FOUNDRY, Cleveland 13, Ohio.

EXECUTIVE

Experienced in all phases of foundry operation and management with thorough knowledge of each shop process, engineering, metallurgy, cost estimating and accounting, sales and industrial relations. Technical graduate. Excellent recommendations. Address: Box 100, FOUNDRY, Cleveland 13, Ohio.

STEEL FOUNDRYMAN

Twenty-five years' practical experience in all phases of foundry procedure in alloy steel castings. Fifteen years in supervisory capacity. Age 44. Address: Box 168, FOUNDRY, Cleveland 13, Ohio.

ANALYTICAL CHEMIST

Older man, long experience iron, steel, nonferrous alloys and ores. Address: Box 145, FOUNDRY, Cleveland 13, Ohio.

Positions Wanted

MANAGER OR SUPERINTENDENT

Thirty-five years' practical experience in foundry—molder 18 years, have been foreman, superintendent and general manager. Did consultation work in various foundries. One was losing $7,000 per month when I started, in seven months it was making good money. If you are in trouble I am the man you need. At present general manager of small shop making gray iron, semi-steel, some brass and aluminum. Have been there twelve years. Desire a change; available immediately. Best of references. Address: Box 177, FOUNDRY, Cleveland 13, Ohio.

INDUSTRIAL ENGINEER OR ASSISTANT TO MANAGER

Several years' experience in all types of foundries, also precision castings. Are you interested in improved methods and cost reduction program, then consult a well qualified man. Address: Box 169, FOUNDRY, Cleveland 13, Ohio.

Representatives Wanted

REPRESENTATIVES

Representation desired in foundry centers of United States and Canada for our Nomad Conveyor and Foundry Equipment on an exclusive basis.

Representative should be familiar with foundries and foundry operations. Should also be able to lay out conveyor and material handling equipment to be successful.

WRITE: WESTOVER ENGINEERS
EQUIPMENT DIVISION
3110 W. FOND DU LAC AVE.
MILWAUKEE 10, WISCONSIN

OR SEE US—CLEVELAND FOUNDRY SHOW —MAY 8-14

REPRESENTATIVES WANTED

Midwest firm manufacturing metal melting furnaces desires representation in various districts in the United States. Must have industrial furnace or oven experience.

BOX 167
FOUNDRY CLEVELAND 13, OHIO

METALS, MINERALS, CHEMICAL

Salesman, with industrial clientele, wanted on high commission. Write complete personal and sales data in confidence. Include photo. **BRAM CHEMICAL CO., 820-65th AVE., PHILADELPHIA 26, PENNSYLVANIA.**

SALESMAN

TO SELL CEREAL CORE BINDERS TO THE FOUNDRY INDUSTRY. Must be experienced core or sand technician. Permanent, salaried position with large manufacturer. If you have the necessary experience and believe you can produce Write: Box 151, FOUNDRY, Cleveland 13, Ohio.

SALESMAN WANTED

Eastern steel foundry has opening for experienced inside salesman familiar with alloys and having aggressive sales technique. Address: Box 156, FOUNDRY, Cleveland 13, Ohio.

SALES REPRESENTATIVES

To handle well-established line Corn Cereal Binders. Open territories available at Birmingham, Buffalo, Cincinnati, Cleveland, Houston, Indianapolis, Minneapolis, San Francisco and Seattle. Address: Box 173, FOUNDRY, Cleveland 13, Ohio.

Employment Service

SALARIED PERSONNEL

$3,000-$25,000. This reliable service, established 1927, conducts confidential negotiations for high grade men who seek a change of connection under conditions assuring if employed full protection to present position. Send name and address only for details. Personal consultation invited. Address: JIRA THAYER JENNINGS, 241 ORANGE STREET, NEW HAVEN 10, CONN.

NEED CAR UNLOADERS?

Use Manpower, Inc. men to unload your cars of sand, coal and materials. Call MANPOWER, INC. in Milwaukee, Chicago, Cleveland, Cincinnati, St. Louis, Philadelphia, or write **MR. RICHMAN, MANPOWER, INC., 330 WEST KILBOURN AVE., MILWAUKEE 3, WISCONSIN.**

Employment Service

FOUNDRY PERSONNEL SPECIALISTS
National Placement and Procurement of

GENERAL AND PLANT MANAGERS, PLANT SUPERINTENDENTS, FOREMEN—ALL DEPARTMENTS, METALLURGISTS, ENGINEERS, CONTROLLERS, ACCOUNTANTS, SALESMEN, SALES MANAGERS, PERSONNEL DIRECTORS, PURCHASING AGENTS.

Confidential Inquiries Invited
From Employers and Qualified Applicants.

For Fast Competent Assistance Contact

JOHN COPE, DIRECTOR **37 S. WABASH, CHICAGO 3, ILL.**
IMPERIAL PERSONNEL **FRANKLIN 2-4233**

Wanted-To-Buy

WANTED TO BUY

Profitable gray iron foundry located in Middle West producing squeezer or light roll-over castings. Equipment and business only. No real estate.

BOX 977
FOUNDRY CLEVELAND 13, OHIO

WANTED TO BUY

One late model #3 Simpson Mixer with or without cooling hood. Must be in good running condition.

THE FOREST CITY FOUNDRIES COMPANY
2500 WEST 27th STREET
CLEVELAND 13, OHIO

WANTED TO BUY

Always in the market for surplus used foundry equipment. Contact us before selling. Interested especially in complete plants. Will go anywhere.

UNIVERSAL MACHINERY & EQUIPMENT CO.
320 E. BROAD ST.
SHILLINGTON, PA.
PHONE: READING 7-1321

WANTED

Used induction furnace for ferrous metals. Holding capacity in range of 500 to 1000# desired.

Advise age and make and all details regarding electrical equipment.

BOX 978
FOUNDRY CLEVELAND 13, OHIO

PERIODICALS

Wanted to buy for cash. Back volumes and sets of Transactions American Foundrymen's Society and other scientific and technical Journals. Address: **ASHLEY, 24 East 21, New York 10, New York.**

MIXERS WANTED

Used Simpson Intensive Sand Mixers. State size, condition and lowest cash price or immediate acceptance. Address Box 578, FOUNDRY, Cleveland 13, Ohio.

MACHINERY WANTED

Induction Furnaces, Screens, Simpson Mixers, Riehle Compression Testing Machines, Pulverizers, Grinders, Conveyors. Address: **CONDENSER SERVICE & ENGINEERING CO., INC., HOBOKEN, NEW JERSEY, BA 7-0600.**

WANTED TO BUY

Used Milwaukee jolt squeeze and small gas fired core oven. Preferably in Illinois, Wisconsin, or on Pacific Coast. Address: Box 182, FOUNDRY, Cleveland 13, Ohio.

WANTED TO BUY

Oil fired brass melting equipment, stationary or tilting complete with blowers and oil pump. Address: Box 144, FOUNDRY, Cleveland 13, Ohio.

WANTED

1—High frequency induction furnace, 1 or 1½ ton capacity, complete with control panels, condensers and generator. Address: **J. ZINSS, 316 S. HICKORY ST., SCOTTDALE, PA.**

Foundries For Sale

FOUNDRIES FOR SALE

IRON FOUNDRY, 12 ton capacity, mostly machine molding, land for expansion, good equipment. Price $25,000.

IRON FOUNDRY producing 20 tons high grade machinery castings per day. All modern equipment. This foundry is producing at a low cost and has an excellent organization.

EDWARD H. ZOLL
FOUNDRIES SOLD AND LEASED
790 BROAD STREET NEWARK 2, N. J.

FOR SALE

6700 square foot foundry, including complete sand laboratory, fire-proof pattern vault, storage sheds, excellent equipment for all type sand cast metals. Building and wheelabrator partially damaged by fire. Have good customers but destruction of machine shop by fire forces immediate sale.

WILBUR C. RICE
GREENWICH, NEW YORK
PHONE: SALEM 3528

FOR SALE OR RENT

Cast iron foundry, main building brick construction 50' x 100', addition 20' x 50'. Railroad siding, also 200' x 110' open ground for further expansion. Foundry is fully equipped with all necessary machinery; employment 18. Interest in another active business necessitates sale. Address: Box 149, FOUNDRY, Cleveland 13, Ohio.

FOR SALE

Brick and steel foundry, Southern Illinois, 160 x 320 feet, overhead monorail, water transportation available. Ideal for mechanized operation, contains equipment. Address: Box 920, FOUNDRY, Cleveland 13, Ohio.

FOUNDRY FOR SALE

Small gray iron foundry in Southern state which leads the South in industrial expansion. Opportunity for one with "know how" and small capital to own profitable business. Address: Box 142, FOUNDRY, Cleveland 13, Ohio.

CAST IRON FOUNDRY

For lease or sale. Wonderful opportunity. Owner wishes to retire. Address: **J. S. REED, COLBY, KANSAS.**

FOUNDRY—ALUMINUM-BRASS

Complete nonferrous foundry, fully equipped. Non-union shop. Many good accounts, doing good sales volume. Priced low at $15,400. Address: **APPLE CO., BROKERS, CLEVELAND 15, OHIO.**

FOR SALE OR LEASE

Well equipped brass and aluminum foundry in central Indiana. Now operating. Address: Box 179, FOUNDRY, Cleveland 13, Ohio.

Accounts Wanted

MANUFACTURERS' AGENT

Establishing manufacturers' agency business with Cleveland headquarters to specialize on foundry machinery and equipment. Fifteen years' experience as foundry equipment sales manager, salesman calling on foundries Middle West. Graduate engineer. Seeking additional quality lines. Address: Box 176, FOUNDRY, Cleveland 13, Ohio.

Opportunity

BRASS FOUNDRY EXECUTIVE RETIRING

Needs aggressive man age 35-40 to take over duties with object of ownership.
Must invest $10,000.
High production unit, a going business established 30 years, California area.

BOX 174
FOUNDRY CLEVELAND 13, OHIO

OPPORTUNITY

Royalty shall be paid by French foundry for special ferrous alloys and cast iron, for the license to produce and sell in French territory machines or devices having an important market, comprising a high proportion of cast pieces and a reduced machining.

SOCIETE DE PRODUITS METALLURGIQUES
148 BOULEVARD HAUSSMANN
PARIS (8e) FRANCE

CANADIAN COMPANY

With foundry and machine shop facilities would like new lines to manufacture on royalty or other basis for Canadian market. Nonferrous preferred.

BOX 114
FOUNDRY CLEVELAND 13, OHIO

SILICA SAND
(Sharon Conglomerate)
If interested and equipped to handle sizable quarrying operation, owner of deposit located approximately 25 miles from Cleveland will consider proposition. Give details and address reply: Box 164, FOUNDRY, Cleveland 13, Ohio.

PARTNER WANTED
With foundry for manufacturing $2 to $3 million worth of alloy castings yearly. Address: Box 166, FOUNDRY, Cleveland 13, Ohio.

Foundry Work Wanted

LOWEST COST
Top quality guaranteed. Foundry and machine shop work. Low taxes. Low wage scale. Send drawings for prompt low price quotation. Address: **AMERICAN FOUNDRY AND MACHINE SHOP, APARTADO 2610, MEXICO CITY, MEXICO.**

Pattern Shop For Sale

PATTERN SHOP FOR SALE
$10,000 in Los Angeles. Growing business in growing area. Address: Box 112, FOUNDRY, Cleveland 13, Ohio.

For Sale

FOR SALE

1—Pangborn industrial type unit dust collector, No. 223 "CK" 3,000 C.F.M. capacity complete with motors.
1—American dust collector, type ASSEM, size 65, complete with motors.

GREAT LAKES FOUNDERS & MACHINE CORPORATION
LUDINGTON, MICHIGAN

FOR SALE

1—No. 27 x 36 American Wheelabrator tumblast complete with skip hoist. All in excellent condition.

MARCH BROWNBACK CO., INC.
SOUTH & CHARLOTTE STREETS
POTTSTOWN, PENNSYLVANIA

FOR SALE
Reda furnace, Model 550, gas and/or oil fired. Address: **MILES FOUNDRY COMPANY, 14118 MILES AVE. CLEVELAND 28, OHIO.**

For Sale

FOR SALE

MOLDING MACHINES
1—Plain jolt machine, 60" x 72" table, 16" cylinder.
2—No. 275 Osborn jolt squeezers.
2—Deuscher Stationary jolt squeeze.
2—SPO #611B Stationary Oscillating Jolt Squeeze Strippers.
1—#610 Johnston & Jennings Air Jolt Rollover Draw Portable 24 x 30 table.
1—Tabor 36 x 50 table Air Jolt Rollover Draw, 3000# capacity.
1—Tabor Pedestal Core Rollover Hand Ram Rollover Draw 14 x 20 table 8" draw.
BLOWERS FOR CUPOLAS AND FURNACES
2—15 HP Spencer-Turbine 2250 CFM at 16 oz.
10—High temperature blowers 1400° F. 9000 to 15,000 C.F.M.
2—#7½ Roots rotary blowers—27 x 81—14000 CFM.
1—Connersville rotary blower 22 x 66 45 cu. ft. per revolution 9000 CFM.
Maxon-Premix Blowers for Gas ¼ to 1 HP.
2—5 HP 20-oz. Spencer Turbine Blowers.
2—2 HP 20-oz. Spencer Turbine Blowers.
METAL MELTING EQUIPMENT
1—1000# open flame brass melting furnaces, gas fired.
1—550# Reda Furnace, nonferrous or iron—oil or gas.
1—Hausfeld Stationary Brass, oil or gas burner, 200# cap.
1—Hausefeld Tilting crucible, gas, 250# Al Cap.
1—Hausfeld 2000# aluminum capacity furnace, barrel type, open flame, oil fired.
New 32" to 41" dia. shell cupolas made to order.
New 1000 lb. aluminum cap. tilting crucible furnaces to specifications.
MISCELLANEOUS
1—9 x 8 Ingersoll-Rand compressor, 173 CFM, 100 lbs. pressure, 25 HP.
1—Stoney crane type shakeout.
1—NC-4 Royer sand separator.
1—#1 Demmler core blower.
2—#16 Roto-clone units complete.
1—McLeod Small Sand Blast Barrel 24 x 24.
1—30 x 48 tumbling mill.
1—36 x 48 tumbling mill.
Complete stock of rebuilt mill and dust exhaust blowers.

CLIFTON MACHINERY COMPANY
1023 W. SIXTH ST. CINCINNATI 3, OHIO

FOR SALE
TURBO BLOWERS WITH MOTORS

CFM	PRESS.	MAKE	CFM	PRESS.	MAKE
4500	16 oz.	G.E.	400	16 oz.	Spencer
3500	40 oz.	Spencer	400	4.3 oz.	Spencer
2800	1 oz.	Spencer	340	20 oz.	A-B
2700	16 oz.	Spencer	320	12 oz.	Spencer
2500	7 oz.	Sturt.	225	16 oz.	Spencer
2000	2½ oz.	Spencer	180	15 oz.	Spencer
2000	1 oz.	Spencer	110	16 oz.	Spencer
1300	16 oz.	Spencer	9100	7" SP	Sturt.
1150	20 oz.	No.Am.	2344	2" SP	Clarage
675	16 oz.	No.Am.	1100	4½" SP	Bayley
660	20 oz.	A-B	100	7" SP	Spencer
500	10 oz.	No.Am.			

THE MOTOR REPAIR & MFG. CO.
1552 HAMILTON AVE.
CLEVELAND 14, OHIO

POWER TOOL GRINDERS
Save 50%
Close out sale on six 1 H.P. pedestal mounted grinders. G.E. Motors, 1740 RPM, 3 phase, 220/440 volts, 60 cycles. Will carry two 12" x 2" wheels. Includes guards, column, tool rests, snap switch. Price $125.00 complete, f.o.b. Plymouth, Indiana. Grinders have never beeen used. Write for further details. Address: **CLIZBE BROS. MFG. CO., PLYMOUTH, INDIANA.**

FURNACES FOR SALE
Ten used heat treating furnaces and two 7-ton gantry cranes. Good condition, priced to sell. Address: **BAER STEEL PRODUCTS, INC., BOX 1428, BOISE, IDAHO.**

CLASSIFIED ADVERTISING

For Sale

REBUILT & GUARANTEED EQUIPMENT

6—275 J Osborn Jolt Squeezers
14—Tabor Jolt Squeezers
25—Rapid Jolt Squeezers
4—International Jolt Squeezers
6—Milwaukee Jolt Squeezers
2—Milwaukee #15362 Jolt Pin Lift, 12" lift
1—Milwaukee 195—3 Jolt Squeeze Pin Lift
1—International PK 10 Jolt Squeeze Pin Lift
4—International Type RJ Jolt Ram Hand Turnover, Hand Draw, New
2—International Type GSR Hand Ram Air Turnover, Air Draw
3—Osborne #601 Jolt Rollover Pattern Draw
1—Osborne #341 Portable Jolt Rollover
2—International Type GR Rollover
1—Lancaster EAG 4 Muller, max. capacity 9 cu. ft., complete with skip hoist, motors and controls. Price $1850.00
7—NC 4 Royer Sand Conditioners 12 to 15 tons per hour
1—4 x 6 Simplicity Shakeout
5 ton Geared Whiting Ladle
2—4 ton Geared Whiting Ladle
3—Square Tumbling Barrels, complete with Jones Speed Reducers
2—Round Tumbling Barrels 48 x 54"
2—600 lbs. Walker Bronze Melting Furnace with Blower
Chain and Air Hoists
Gas & Electric Fork and Platform Lift Trucks
Blowers—Conveyors—Belt and Roller
1—Type G 1 36" Tannawitz Band Saw
1—Type C 10 AF Tabor Abrasive Cut Off Machine, 10 H.P. Motor

GEORGE W. CASSADY COMPANY
P.O. BOX 238
WILLIAMSPORT, PA.

BUY—TRADE—SELL

27 x 36 Wheelabrator tumblast	$2,200.00
48 x 42 Wheelabrator tumblast	3,000.00
8' Wheelabrator air table	2,000.00
9' Wheelabrator table blast with smaller tables and 2 throwing wheels	2,500.00
8' Wheelabrator table blast without motors	2,000.00
4' Wheelabrator table blast	1,250.00
3½ GK2 Pangborn rocker barrel	2,500.00

Also all types of Hand Cabinets, Dust Collectors and Pressure Tanks.

If interested in trading your present equipment on any of the above, Call or Write:

DIAMOND SAND BLAST, INC.
5654 W. JEFFERSON
DETROIT 9, MICHIGAN

FOR SALE

1—American Wheelabrator Tum-Blast machine, size 48" x 48", serial #A30146. Arranged for skip loading device. **Model 4N428.**
1—Pangborn #4-CC, serial #332590 dust collector 7'-6" x 10'-0" x 7'-6" reinforced steel casing with two 4' bottom hoppers, motor rapping device. Without blower and motor.

CRUCIBLE STEEL CASTING COMPANY
2850 S. 20th STREET
MILWAUKEE 15, WISCONSIN

FOR SALE

#2 American Multi Table, serial No. A-84721. Five 37" diameter tables. New September 25, 1951. In excellent condition. $950.00 in new parts. Our price for machine complete with electric motors and parts, loaded on railroad car $6,000.00. This machine can be seen in operation at our plant. We are disposing of this equipment as we have discontinued the manufacture of the parts for which this machine was purchased. Address: **NOBLESVILLE CASTING CO., INC., NOBLESVILLE, INDIANA, PHONE 74.**

FOR SALE

One type "AM" American Sandcutter, size 69/45 complete with two electric motors and all electrical equipment, hand-steered, A-1 condition Address: **AMERICAN FOUNDRY & MFG. CO., 1015 HERBERT STREET, ST. LOUIS 7, MISSOURI.**

WHEN YOU ARE IN TOWN FOR THE FOUNDRY CONVENTION GIVE US A CALL. WE WOULD LIKE TO GET ACQUAINTED.

LATEST THING IN CORE OVENS

DIELECTRIC CORE OVEN

Model 1800A—Conveyor Type
Mfg. 1949 by Induction Heating Corporation.

$14,000.00

CORE BLOWERS

#91 **OSBORN**—for small cores	650.00
#193-4 **OSBORN**—for medium cores	1250.00
#94 **OSBORN**—for large cores	2000.00

FORK LIFT TRUCKS

15,000 lb. **HYSTER** Fork Lift Truck	3500.00
6,000 lb. **CLARK** Fork Lift Truck ..	1200.00

MOLDING MACHINES

HERMAN Jar Rollover & Pattern Draw; new in 1944; 48" x 144"—10,000# series	9500.00
HERMAN Jar Rollover & Pattern Draw; 80" cap. 6000# series	1500.00
HERMAN Jar Rollover & Pattern Draw; 30" x 36"; 1500# series; 8½" cylinder; 16" draw	1500.00
INTERNATIONAL JDP Pattern Draw; 600 lb. cap. 8" draw; on wheels	475.00
#2047-3 **OSBORN** Jolt Rollover	275.00
#601-13 **OSBORN** Jolt Rollover	275.00
#413-3 **OSBORN** Jolt Rollover; 130" x 42"	5000.00
#275 J **OSBORN** Jolt Squeezers	125.00
SPO Model 2114 G Jolt Squeeze Strippers; 1951	650.00

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27" x 36" **AMERICAN WHEELABRATOR**	2000.00
48" x 48" **AMERICAN WHEELABRATOR**	6000.00
8' **PANGBORN** Tableblast	OFFER

MISCELLANEOUS

CHICAGO Pneumatic Air Compressor—Diesel operated; 220 H.P.	10,000.00
#2 **CLIMAX** Wire Straightener	250.00
MARSCHKE Swing Frame Grinder—10H.P.	550.00
#6 **WHITING** Cupola Blower	550.00
DESPATCH oil fired drawer type core oven; 5 drawers; Type L-4248-5..	1000.00
ARROW Scooter Loader, 8 cu. ft. shovel lifts 66", 3 wheels, 2 cylinder, air cooled motor	800.00
BEARDSLEY & PIPER Stationary Sandslinger; 19" head, 2 speed motor, 14' arm, 5 ton plate feeder; 6' belt unit	10,000.00

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Machinery Company

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For Sale

FOR SALE

Osborn Molding Machine, jolt rollover pattern draw, pit type, pneumatic drive, draw flask 64", Model 405-1 ..	$1800.00
Osborn Molding Machines, jolt rollover, table 18" x 24", 8½" draw, No. 2047-4	350.00
Tabor Molding Machines, 10" squeeze, yoke and column type	115.00
Adams portable hand squeeze machines, 34"	60.00
Jeffrey Sanditioner, capacity 10-15 tons per hour	400.00
Magnetic particle testing machines	
Rockwell hardness tester, motorized	
Olsen ductility testing machine, motor driven, 40,000 lbs.	
Wheelabrator skip bucket loaders	
Pangborn 1GF barrels, capacity 150 lbs	350.00
Pangborn cabinets, dust collectors, Rotoclones	
Federal sand riddles	65.00

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1—Used "Economelt" Stroman Sklenar type reverberatory Furnace. Oil Fired. Unlined. Capacity—1200 lbs. Brass. Equipped with 4" SK type Oil Burner, 10 oz. Blower. With 5 HP Motor, 220/440 V. 3 Ph. 60 Cy. AC open type. Not including oil pump unit, strainer and relief valve.

Price—$600.00 F.O.B. Milwaukee

MILWAUKEE GAS SPECIALTY COMPANY
P.O. BOX 461
MILWAUKEE 1, WISCONSIN

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1—American Tumblast 36" x 42", excellent condition, $3500.00

1—American Tumblast 12 ft. table with 4-48" tables. Condition excellent and like new, $4500.00 complete, both under power now. Subject to prior sale.

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Blocks—Plates—Rounds
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Excellent condition.
Used 6 months. Best Offer.

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4400 CERMAK ROAD
CHICAGO 23, ILLINOIS

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Floatex shakeout, 48 x 72; B & P Port, sand conditioner 60 tons per hour; B & P Nite-Gang; 43' belt and bucket elevator; Simplicity 2' x 3' screen; many other items. Address: **SOMIL EQUIPMENT & SUPPLY CO., 620 MARQUETTE AVE., SO. MILWAUKEE, WIS., PHONE BR 1-7060.**

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Milwaukee hydraulic model 100 in very good condition. Complete with all motors and controls, accessory equipment, and spare parts. Can be seen in operation. Will produce 1-1½ tons per hour. Suitable for iron, steel, or nonferrous metals. Attractively priced. Address: Box 155, FOUNDRY, Cleveland 13, Ohio.

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First quality aluminum patterns for 4" medium soil pipe fittings. Also complete set of aluminum patterns for waterless aluminum utensils. Address: **ST. JEROME INDUSTRIES LTD., CASTONGUAY ST. WEST, ST. JEROME (TERREBONNE) QUE., CANADA, TEL: 3767.**

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MOLDING MACHINES

1—Osborn #602 roll over

2—SPO #110-J Squeezers

2—SPO #213-GP Squeezer strippers

2—SPO #2114 GR Squeezer strippers

1—SPO #211-G Squeezer

1—Osborn #559-27 Stripper

1—SPO #213C Squeezer stripper

1—Osborn #559 Stripper

1—Osborn #275 JW Squeezer

1—Osborn #275 J Squeezer

1—Osborn Squeezer Stripper

1—SPO #213 UD Squeezer

1—Osborn #720 U Squeezer Stripper

1—International #G104 Roll over

1—SPO #2114G Squeezer Stripper

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1—Magnaflux Demagnetizing Unit
Simpson Sand Mixers 18" dia. Laboratory #0, #1, #1½, #2, #3
Miscellaneous: Screens, Pulverizers, Grinders, Conveyors—all types, Tyler Rotap Screens, etc.
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Kuhlman, 191 KVA, 2200 V Prim, 90 V Sec, 1 Phase, 60 Cycles, 2125 Amps, 40% Reactance. Slightly used. Good condition.

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2—14" x 18" flask size, Milwaukee Jolt, squeeze, strip machines
1—5 K.W. Hi-cycle G.E. Generator
1—19" Beardsley & Piper, slinger head frame

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AMERICAN BRAKE SHOE COMPANY
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DETROIT ELECTRIC FURNACE

Type AA of 1,200 lb. cold metal or 2,600 lb. hot metal capacity, complete with mechanical and electrical equipment for melting and rocking, including oil filled transformer of 11,000 v. primary and 125 v. secondary. Presently crated but available for inspection on 48 hours notice. Ideal for high test cast irons, brasses or bronzes. Price: $9,500.00. Address: **HOPE ELECTRICAL PRODUCTS CO., 338 WILSON AVENUE, NEWARK 5, N. J.**

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- **Overhead sand handling system.**
- **2 No. 3 Simpson Mixers in sand system.**
- **30 Molding stations.**
- **Automatic shakeouts.**
- **Tower core oven.**
- **5 Ton Gantry crane for charging cupolas and unloading freight cars.**

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1—**HOWE** electric **WEIGHOGRAPH** Scale
1—**WHITING** #8A **KATHABAR,** cupola hot blast
10—**GRINDERS,** double end, 5 to 20 HP
1—**LINK BELT** Revivifier 1—**NITE GANG**
1—**40 HP SULLIVAN** Air Compressor
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2,000 ft. **FOUNDRY** type **ROLLER CONVEYOR**
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1—**DEWALT ABRASIVE CUT-OFF,** 10 HP
1—**AMERICAN ROTOCLONE,** size 24W
1—**TABOR ABRASIVE CUT-OFF,** 10 HP
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7—**ARC MELTING FURNACES,** 60# to 15 tons
4—Large **HEAT TREAT** Furnaces
3—**AJAX-TAMA-WYATT** 333 KW for alum. **NEVER USED.**
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1—**AJAX INDUCTION,** Spark Gap Type, 50#
5—**MONARCH** #93 Barrel Type, Tilting

MOLDING MACHINES

1—**MILWAUKEE** Jolt Rollover, 30 x 40" table
3—**MILWAUKEE** Jolt Strippers, 32 x 38" tables
2—**JOHNSTON & JENNINGS** #2 Jolt Squeeze Strippers, priced for quick sale
4—**OSBORN** 710 Jolt Strippers
1—**OSBORN** 444 Jolt Rollover
4—**HERMAN ROLLOVERS:** 60 x 80"; 40 x 60"; 144 x 96"
2—**TABOR POWER ROLLOVERS,** 30 x 40" table
OVER 50 others: **SPO, INTERNATIONAL, HAYNES, DAVENPORT, All TYPES and SIZES**

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Electric Melting Furnaces

LECTROMELT TYPE C Side Charge, 2 ton per hour rated capacity. 7000# to 8000# usual heats. Can handle 16,000# heats. Late type transformers. 1200 KVA, 13,200 volt primary. Complete with all controls. This unit may be seen in place in Cincinnati.

LECTROMELT 500# Type T, Side Charge. G.E. circuit breaker. Moore controls and pittsburgh 300-375 KVA 2300 volt primary transformer.

DETROIT ELECTRIC, 1500# capacity, 13,200 primary voltage. Kuhlman transformers. Complete with controls.

DETROIT ELECTRIC 350#, Type LFA with Kuhlman transformers and oil circuit breaker.

DETROIT ELECTRIC with 350# and 1000# tapered shells, 2300 V Kuhlman Transformer. Complete with panelboard and bus bars.

2—DETROIT 10# Electric Laboratory size melting furnaces, 100 amp, 250 volt.

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FOR SALE

AIR COMPRESSOR

Ingersoll Rand Type 10—14 x 9 x 12, 2 stage, 75 HP, 3/60/220/1200 rpm synchronous motor, 350 CFM at 100#.

BLOWERS

Spencer Turbo Blower, 2250 CFM at 16 oz. 15 HP 3/60/220 totally enclosed motor. New 1947.

Ingersoll Rand Motor Blower Type FS. Single Stage 4000 CFM @ 3.75 PSI, 100 HP, 220 V. G.E. Induction Motor.

Buffalo 7E Direct Connected Blower, 50 HP Westinghouse motor, 3/60/220-440 V, 3535 rpm, 28" wheel, 3500-4000 CFM at 32 oz. Flanged onutlet.

Spencer Turbo Blower. New 1949. 3500 cfm, 28 oz. with 40 HP 220-440 motor and Foxboro controls.

CONVERTER

100 KW Rotary Westinghouse 220 V 60 cycle primary 250 V DC, complete with controller and panel.

CORE BLOWER

1—Redford Core Blower, bench type.

International SB13. Unused, still on original skids.

CRANES

5 Ton P & H Overhead Elec. Traveling Crane, 30'6" span, 15' lift (can be increased) 3 motor, 220 V A.C. New 1946.

10 Ton Northern Overhead Elec. Traveling Crane, double girder, fish belly, 3 motors, 230 V D.C., 54'7½" wide C to C of wheels can be cut down to fit smaller size.

Link Belt Model YC9A Boom type Cargo Crane. 20' max. boom, 7½ ton cap at 5½'. Gasoline motor driven, hard rubber tires. Excellent condition. $3750.00.

CRUSHERS—PULVERIZERS

2—Stedman 15" x 12" Type A. One with 10 HP 220-440 V motor. One without motor.

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2—Bailey (Electric Furnace Co.) 75KW Electric Arcy type side electrode tilting furnaces and transformers.

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St. Regis Model 1S1 Dry Powder for magnesium fires.

Buffalo 50 gal. soda-acid cart type.

FORK LIFTS

Baker 6000# Gasoline Fork Lift Trucks, KMH60, 120" lift, 88" collapsed height, 42" forks, solid tires. Rebuilt-Guaranteed.

Ross Fork Lift Truck, 19 HT, high lift, 6000# capacity, 14' lift, 48" forks. Pneumatic tires. Rebuilt-Guaranteed.

GRINDERS, DISC

Besley 208 Double End 26" x 2⅜" wheel with 2 compound tables, V belt drive, 15 HP, 220-440 totally enclosed motor, magnetic starter controls.

2—U. S. Model 80 Double End 2-18" dia. wheels, 7½ HP motor, 2 swinging tables 8" x 14"—1 with hand lever feed.

Besly #372, 53" diameter wheel, 25 HP spindle motor.

GRINDERS, SNAGGING

McCabe 2" x 24" wheels, 48" between wheels, 3/60/440 V.

Ranson 8B Double End 2" x 20" wheels, 220 V motor, p/b control.

1—Hammond type 20 WR2—3" x 24" wheel, double end grinder, single speed, 20 HP Louis Allis Squirrel Cage, 220-440 V—1760 rpm motor.

2—Norton Type D, 3" x 24" wheel, 66" between centers, flat belt drive.

1—U. S. DE, 7½ HP adjustable speed.

2—U. S. DE, 20 HP adjustable speed.

1—U. S. DE, Model 65, 3" x 24" wheels, variable speed, 20 HP motor.

GRINDERS, SWING

2—Fox 10 HP 3/60/220-440 V, Swing Frame.

U. S. 15 HP, 3/60/440 V Swing Frame, 2 speed.

Fox 15 HP Swing Frame, 2 speed.

Marschke 20 HP, 2 speed.

HOISTS

500# American LoHed.

1000# Cleveland 220/440 V.

1000# Detroit 220/440 V.

5—1000# P & H Hevi Duty with trolley.

2—2000# P & H Hevi Duty with trolley.

2000# Detroit Electric.

2000# American LoHed.

11—4000# P & H Hevi Duty with trolley.

2—4000# P & H Hevi Duty with trolley and powered drive unit for moving hot metal.

2—5 Ton Air Hoists with motor driven trolleys.

LADLES

1 Ton Enclosed Gear Crane Ladle truck type 4 wheel car for 18" gage track, Whiting Junior.

1—20½" Top Whiting Enclosed Gear Ladle.

MOLDING MACHINES

2—Champion Pin Lift Pushoffs, 46" x 46" x 12" draw.

1—Champion Hand ram, hand clamp, hand rollovers 26" x 14" table.

1—Champion Hand Ram, Hand rollover, Hand draw core machines, 15 x 15 bed.

3—Davenport Portable Jolt Rollover Pattern Draw 20" x 24" tables, open end, 8" draw.

1—International Type G 24 x 10 Jolt Rollover, foot draw, 22 x 30 table, 10" draw.

1—Herman Molding Machine Jolt Rollover Pattern Draw, 20 x 30.

1—Herman Molding Machine Jolt Rollover Pattern Draw, 20 x 36.

1—International Type G 30 x 12 Jolt Rollover Foot Draw, 28" x 36" table, 12" draw.

1—International Type G 30" x 30" table, 9" draw, Portable.

2—International Type G 18" x 56" table, 8" draw. Portable.

1—International Type F Jolt Rollover 27 x 12, 12" draw, 35" x 26" table.

1—International Jolt Rollover Pattern 10" Draw, 22" x 30" plate, 6" jolt cylinder.

1—International Plain Jolt Molding Machine 48" x 60" table, no pit required.

1—Herman Jolt Rollover Pattern draw, 40" x 84" table, slotted nickel alloy table over regular table to accommodate various sized flasks, air clamp, new 1946. Used very little.

1—Herman 20" x 30" rollover pattern draw, 750# series. Air clamp.

2—Herman 20" x 24" Jolt Rollover Pattern Draw, 750# series. Air clamp.

1—Herman 4000# Series High Speed Rollover 30" x 60" with 32" x 48" bumper, 13" cylinder pattern device.

2—Milwaukee Arm Type Jolt Squeeze Strippers, 1500# capacity, Model 163-50 Serial 13104-5, 15" x 24" table, 16" x open end, pattern size. Late type.

1—Osborn 76J Portable Jolt Squeeze Molding Machine 12" cylinder.

3—Osborn Jolt Squeeze Molding Machines, 275J, 16 x 20 table, tilt back head.

2—Osborn 405 Jolt Rollover 40" x 70", 2000# capacity, 20" x 60" jolt table and 4 wheel receiving car.

1—Osborn Portable Jolt Rollover Pattern draw, 900# capacity. Model 601-13. 30" x 24" flask size, 10" draw.

1—Tabor 1000# Rollover, 30" x 60" table.

MULLERS AND MIXERS

Simpson #2 Motor on base, bucket loader.

Simpson #3 Motor on base, bucket loader.

Simpson #3 Type H open gear type.

Simpson #3 Open Gear Type. $1000.00.

American Model M Sand Cutter, 70" blades. Kwick Mix Paddle Type.

Royer NDP 47 14" Belt, 4 rubber tires.

1—Simpson #1 Style K Muller with Bucket Loader, 4 cu. ft. size.

1—B & P #70 Preparator, used 3 months.

ROTOBLAST

Pangborn, table with 3-8" rotating work tables, 3 position loading, cleaning and touch-up designed for work similar in size to aircraft cylinders. Like New condition.

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1—3' x 5' Link Belt.

2—4' x 6' Simplicity.

SPEED REDUCERS

Cleveland 408-R1, 36 to 1, 20.5 HP.

Falk Motoreducers 7½ HP.

U. S. Syncrogear Motors 7½ HP.

U. S. Syncrogear Motors 5 HP.

TUMBLING BARRELS

Whiting 30" x 48".

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2—Climax 1 HP motor.

1—Kane & Roach 3 HP motor.

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MOLDING MACHINES

3—**S P O** No. 110J Portable Jolt Squeeze Machines, 1952 machines. Used 3 months.
2—**S P O** No. 506 Jolt Rollover Pattern Draw, 600 lbs. Cap., 10" Draw, 24" x 25" Table.
6—**OSBORN** No. 275J, Jolt Squeeze Machines, portable and stationary models.
3—**OSBORN** No. 559 HD Jolt Strippers, stationary, Table 25" x 30", Jolt 1200 lbs.
1—**OSBORN** #405-79 Jolt Rollover Pattern Draw Molding Machine 40" x 72" Table Size, Capacity 3500 lbs.
3—**OSBORN** Model 601, Jolt, Rollover, Pattern Draw. 600 lbs. cap. Flask 30".
1—**OSBORN** No. 333 H Jolt, Squeeze, Power Rollover, Pattern Draw, 2000 lbs., Jolt, 22" x 44" Table Jolt Cyl. 12". Draw 22".
2—**OSBORN** No. 142 Jolt, Rollover, Foot Draw, 14½" x 24" Table Draw 8", 350 lbs. capacity.
1—**JOHNSTON & JENNINGS** #401-C, Portable, Jolt Squeezer.
1—**JOHNSTON & JENNINGS** #681-C, Portable Jolt Stripper, 24" x 30" Table.
1—**JOHNSTON & JENNINGS** #918-B, 44" x 54" Table, 3000 lbs capacity, 20" Draw.
1—**JOHNSTON & JENNINGS** Model 1216S Stationary Jolt Pin Lift, table size 36" x 54", Draw 16". Capacity 3000 lbs.
1—**JOHNSTON & JENNINGS** Air Jolt Machine, 20" x 30" Table 6" cylinder.
1—**TABOR** Jolt Rollover and Pattern Draw, Draw 10", 600 lbs. Capacity, 22" x 42" Table. Shockless Jar, Portable.
1—**INTERNATIONAL** Model PKL, Jolt Squeeze, Air Pin Lift Machines, 18" x 24" Table, Lift 5½", Squeeze Cyl., 12".
1—**INTERNATIONAL** Model MJ, 16" x 4" Draw, Power Jolt Hand Rollover.
5—**INTERNATIONAL** Type "R" Hand Ram, Hand Turnover, Foot Draw.
2—**INTERNATIONAL** Type "HJ" Jolt Ram, Hand Turnover, Foot or Hand Lever Draw Machines. Various sizes.
2—**INTERNATIONAL** Type RES, Size 15" x 8", Jolt Squeeze, Rollover, Draw Machines. Table size 18" x 34".
4—**INTERNATIONAL** Type G, Air Jolt, Air Turnover Foot Draw Machines. Sizes 20" x 8"—24" x 8"—30" x 8"—24" x 10".
2—**CHAMPION** JS-10-P, Jolt Squeezer, Portable, Serial No. 5770, Table size 18" x 26". One like new, still crated, 2—Heads.
1—**CHAMPION** Model No. JM 16, Serial No. 5092, Power Jolt, Hand Turnover, Foot Draw Machine, 13" x 17" table.
1—**DAVENPORT** Model 28, Jolt Rollover, and Pattern Draw, 1500 lb. Jolt Capacity, 12" Draw, 30" x 40" table.

MULLERS

1—**SIMPSON** No. 1½ Sand Muller. Unit Drive, 750 lb. batch. With Skip Hoist.
1—**SIMPSON** No. 2 Sand Muller. Complete with motor and drive. Open Gear type.
1—**SIMPSON** No. 3 Sand Muller, Open Gear Type with Motor Drive.
1—**BEARDSLEY & PIPER** No. 60 Speed Mullers, 10 cu. ft. w/motor and drive.
1—**CLEARFIELD** #404 Late Type. Sand Muller, Motor 220 V.

SAND PREPARATORS

4—**BEARDSLEY & PIPER Model "S"** Screenerator, Pneumatic Tires.
1—**BEARDSLEY & PIPER** Model "M" Screenerator, on pneumatic tires.
1—**BEARDSLEY & PIPER** Sand Conditioner, complete with magnetic separator, 10 H.P. totally enclosed motor, overhead hopper, 90 cubic ft. & aerator. Serial Number SC-73, 1946 machine.
1—**ROYER** Model NB-2 Sand Conditioner, portable, 7 to 9½ tons.
1—**ROYER** Model C-2 Sand Conditioner, portable, 25 to 30 tons per hour.
1—**JEFFREY** Type "P" Sand Conditioner, Class B Mixer, Portable, Serial No. 377.
1—**AMERICAN** Sand Cutter, Model AM, Size 69 x 45.
1—**AMERICAN** Sand Cutter Model 79 x 60.
1—**ROYER** Shakeout and portable sand conditioning unit.

CORE OVENS

1—**COLEMAN** Core Oven, gas fired, 2 doors, 6' high, 5' wide, 4' deep. W/burners.
2—**DISPATCH,** Gas Fired, Drawer Type Core Ovens, Drawers 46" wide, 59" deep, 9" high. Complete with Rail Supports and Controls. These machines are in excellent condition and were new in 1944.

CORE BLOWERS

1—**OSBORN** No. 91, Serial No. 10050.
2—**OSBORN** No. 92 Core Blowers, Serial No. 9703A and 8692-C. Air Clamps.
1—**DEMMLER,** No. 1-E Core Blower, Serial No. 3287. Air Clamps, 1950 unit.
1—**DEMMLER** No. 2 with Air Clamps.
2—**REDFORD** No. 1, Cartridge Bench Type.

GRINDING EQUIPMENT

1—**FOX** Stand Grinder #5, single wheel, size 24" x 2", 10 H.P. 220/440 V.
1—**HAMMOND** Model WR-1 Double End Snagging Grinder, 7½ H.P., 220/440/3/60.
2—**HAMMOND** Model WH-10 Double End Grinders with (2) 7½ H.P. 220/440 3 phase, 60 cycle, wheel size 20" x 2" x 2".
2—**U. S. ELECTRIC** Double End Snag Grinders, 20" Wheel, 5 H.P. Motor.
6—**U. S. ELECTRIC** Model 69, adjustable speed snagging grinders, 4 speed changes, 30 H.P. Motor.
6—**MARSCHKE** Swing Frame Grinders, 20 H.P. and 25 H.P. models.
1—**QUEEN CITY** Model 100 Double End Disc Grinder with 10 H.P. 220/440 Volt Motor size 20" x 2" x 2", Very Late.
1—3 H.P. Double End Grinder.
1—Safety Portable Swing Grinder 24" x 3", 15 H.P. Motor.

SAND BLASTING EQUIPMENT

1—**AMERICAN WHEELABRATOR** Tumblast, 36 x 42, with Skip Hoist & Shot Return. Serial No. A-37913.
1—**AMERICAN WHEELABRATOR** Multi-Table Blast Machine, 8-27" Tables, with Shot Return and Dust Collector. Serial No. A-44791, Model BM 66900.
1—**PANGBORN** Room Blast 10' x 12' x 12', complete with Tank, Elevator, Dust Collector and Safety Equipment.
1—**NEW HAVEN** Air Blast Barrel 48" x 42", with Motor and Drive, 1942 unit.
1—**WHITING** Tumbling Barrel 30" x 60", plate 1", complete with 5 HP gear head motor, drive, and starter, 1952 unit.
4—Tumbling Barrels, 36" x 72". 1¼" plate.

MELTING FURNACES

5—**FISCHER,** #400 Crucible, type BBI mechanical tilting, with motors, blowers, new crucible, and bricking, gas or oil fired. New in 1949.
3—**FISCHER** Model MNP Tilting Furnaces, size 2400, complete with New Pot, blowers, and electrical tilting mechanism.
2—**FISCHER** #225 Crucible, type BBI, mechanical tilting, w/motors, blowers, etc., gas or oil fired.
1—**FISCHER** #125 Crucible, type BBI, mechanical tilting, w/motor blower, gas or oil fired.
6—**BELLVIEW** Tilting Furnaces 550 lbs. capacity, with pots. 2-H.P. motor and blower. Gas or oil burners.
1—**REDA** 550 lb. Hydraulic Tilt, Gas or Oil Fired. 1952 Unit.
1—**STROMAN** #600, Model "U" Tilting Furnace, 3 H.P. motor and blower, gas fired, with extra shell. New in 1949.
1—**YORK WALKER** #28 Tilt Furnace, 300-400 Crucible, complete with new bricking, motor and blower.
4—500 lbs. capacity Holding Furnaces, newly bricked, w/burners, motors and blowers.
3—Stationary Pit Type Furnaces, #125 Crucible. W/burners, motors, blowers.

MODERN POURING DEVICES

6—**MODERN** Pouring Device, Model "F". With 17" Taper Covered Ladles, 500 lbs. capacity, and Hand Tilting Devices.

WHITING POURING LADLES

1-2-4-5-8½-10 ton capacity, all nose tilting, totally enclosed gearing.

HEAT TREAT FURNACES

1—**YOUNG** (3) Compartment Pull Drawer Oven, for Magnesium, each compartment 6'6" wide x 5'9" deep x 7' high inside (3) Drawers to each compartment. Electric heating for temperature of 800°. For Heat Treating, Drawing, Stress Relieve.

CONVEYORS—Apron - Roller - Belt

1—**FARQUHAR** 167' x 24" Trough Conveyor, 375' of 5 ply belting. 15 H.P. Motor and Drive. New in 1952. Used 3 months.
1—**JEFFREY** 24" wide 10'3" centers, Trough Conveyor, with Stearns Magnetic Pulley, Motor and Reducer.
1—**GODFREY** 18" x 19' Under Car Unloader, with 3 H.P. Motor, Steel Belt.
1—18" x 24' Apron Conveyor, Steel Link Belt, complete with motor and drive.
1—24" x 20' Apron Conveyor, Steel Link Belt.—Less motor and drive.
500'—**MATHEWS** Roller Conveyor, Above Rail 20" wide, 2½" Rollers, on 4" Centers.
300'—**MATHEWS** Roller Conveyor, Above Rail 24" wide, 2¾" Rollers, 4" Centers.
60'—Roller Conveyor 14" wide, 2" Rollers, above rail. 6" centers.
1—**FARQUHAR** 18" x 40' Model 343 Portable Trough Conveyor with 5 H.P. motor, starter, 3 sided feed hopper. 1952 Unit.

BUCKET ELEVATOR

1—**JEFFREY,** 106' Belt 13" wide, 50' center to center of Drive Pulleys, 106—12" x 8" x 11¾" continuous type buckets, with Jones Reducer.

AIR HOISTS—ELECTRIC HOISTS

2—**INGERSOLL RAND,** Size D, 4000 lbs.
1—**INGERSOLL RAND,** Size B 1000 lbs.
1—**LITTLE GIANT,** Model A, 1000# cap.
4—**THOR PNEUMATIC,** 1000 lbs. capacity.
1—**SHEPPARD** 5-Ton D.C. Hoist, 6 H.P. Motor, 230 V.
1—Electro-Lift, 3000 lbs cap. 220/440 low head room cable hoist.

SHAKEOUTS

1—**SIMPLICITY** Shakeouts, 3' x 3', Serial #33—SOS—106, Model S, 1000# cap.
1—**SIMPLICITY** Shakeout, 5' x 7', Serial #57—SOBG—185, Model BG, 5000 lbs.
1—**SIMPLICITY** Shakeout, 4' x 6', Serial No. 46—SOB—145, Model B.
2—**SIMPLICITY** Shakeouts, 4' x 8', Serial No. 48—SODE 104, Model DE, 16,000 lbs. capacity.

BLOWERS

1—**BUFFALO FORGE** No. 7-E Blower, 25 H.P., 3600 rpm, 220/440 volts. 28" wheel, 32 oz., 1600 cfm.
5—Assorted Blowers for Furnaces, 2-3-5-7½ H.P., 16 oz.

SAND SLINGER

1—**B & P,** model DB, stationary type, 16" head, 4" tip, first arm 10'3", 4' ramming unit. Motor-dual, 10-15 HP, 220-440 V. 60 cy.

MISCELLANEOUS

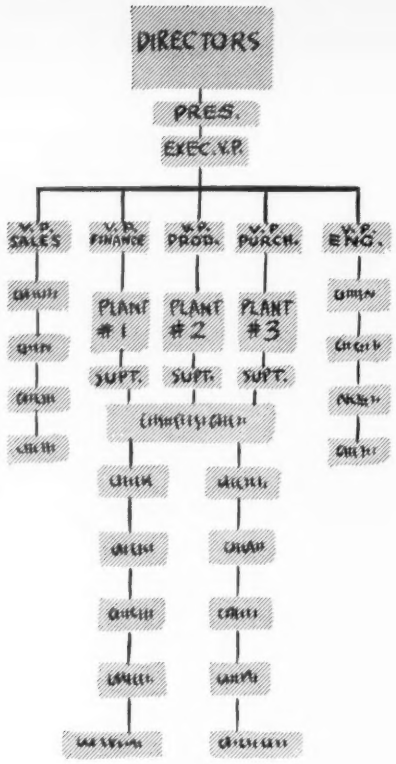
1—**INGERSOLL RAND** Air Winch. Size MHO.
1—**SCHMEIG** Spark Arrestor.
1—**LINK-BELT** Car Puller.
1—**PANGBORN** Exhauster No. KW2.
1—**PANGBORN** Exhauster No. 10KX.
1—**PANGBORN** Exhauster Size #7.
1—**PANGBORN** Exhauster Size C.
1—**ELECTRO-MAGNETIC** Pulley 24" x 24".
3—Electric Riddles, 21" diameter, ⅓ H.P. Motor, 110 volts.
1—**CLIMAX** Wire Straightener No. 2A.
2—**SYNTRON** Vibra Flow Feeds, Type F 210. Style 1538.
3—**LEEDS & NORTHRUP** Model "S" Micromax.
1—Cupola Lighter, Tank and Torch.
1—**HOWE,** Weightograph 6000 lbs. capacity 4' x 5' Platform.
1—**DIETERT** #540 Comb. Lab Sifter.

AAA MACHINERY & EQUIPMENT CO.

15539 SARANAC ROAD *Members of American Foundrymen's Society* **CLEVELAND 10, OHIO**

ALL EQUIPMENT SOLD WITH A FULL MONEY BACK GUARANTEE

How much SALES POWER does it take today?



Selling to industries isn't what it used to be.

For every worthwhile plant a dozen years ago, you now have two, three, or four to be contacted. Inside the plants, the picture has changed, too. Growth has greatly expanded the number of men who have something to say about the selection or rejection of your products.

You may say, "Oh, we've doubled our sales force to take care of this!" But even a doubled sales force may not be a match for the size and complexity of today's industrial selling job.

Add to this the tougher competition you're up against and you can see why it takes a whale of a lot more SALES POWER now.

It isn't *number* of salesmen alone that determines your SALES POWER. It's the calibre of men—their training—their enthusiasm for your products—and how well their contact time is matched to the real sales potential.

With all these things at their best, your sales force can personally contact only a fraction of the vast parade of buying influences constantly moving through industry's key positions.

It's the advertising support you give your salesmen that multiplies their effectiveness by making your products wanted in more plants. It's this advertising support that pipes information about your products to far more key men than your salesmen can ever contact personally.

It's this advertising support, adequately related to the size of your selling job, that steps up your SALES POWER and increases the productivity of your sales force. Whether your advertising program is adequate to today's selling job, is something your advertising agency can best help you evaluate.

THE **PENTON** PUBLISHING COMPANY

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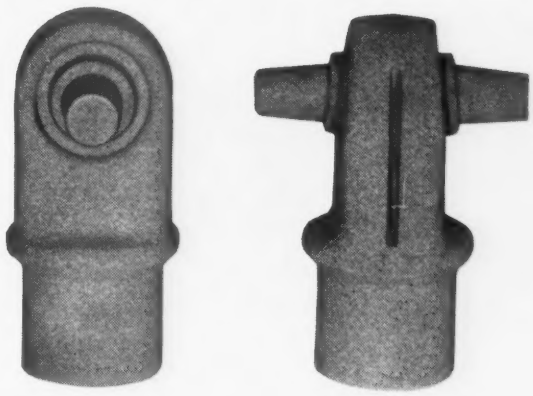
Do you know the 3 C's that make better core oils?



In Houghton's "3-C" processing of core oils you can find the answer to better cores; faster, easier core making and baking; and less casting rejects because of core failure. Here are the "whys" and "hows" of Hy-Ten Core Oils.

Controlled:

Every processing step in the Houghton plant, from raw materials to finished product, is closely controlled not only for chemical composition but for physical characteristics as well.

Catalytic:

Modern catalytic processes are used to bring about the necessary chemical reactions and make every ingredient in the formulation play its part in producing a stronger, safer core binder.

Co-polymerization:

The basic components are polymerized to insure a core oil in which each ingredient helps to strengthen the bond. There are no free-riders in the form of un-polymerized ends to weaken the bond or "gas" in pouring.

Ask the Houghton man to show you how these Houghton developments can help you get better cores, better castings and fewer rejects. Latest Hy-Ten bulletin will be mailed if you write E. F. Houghton & Co., 303 W. Lehigh Avenue, Philadelphia 33, Pa.

HY-TEN CORE OILS

THE 3-C CORE OILS

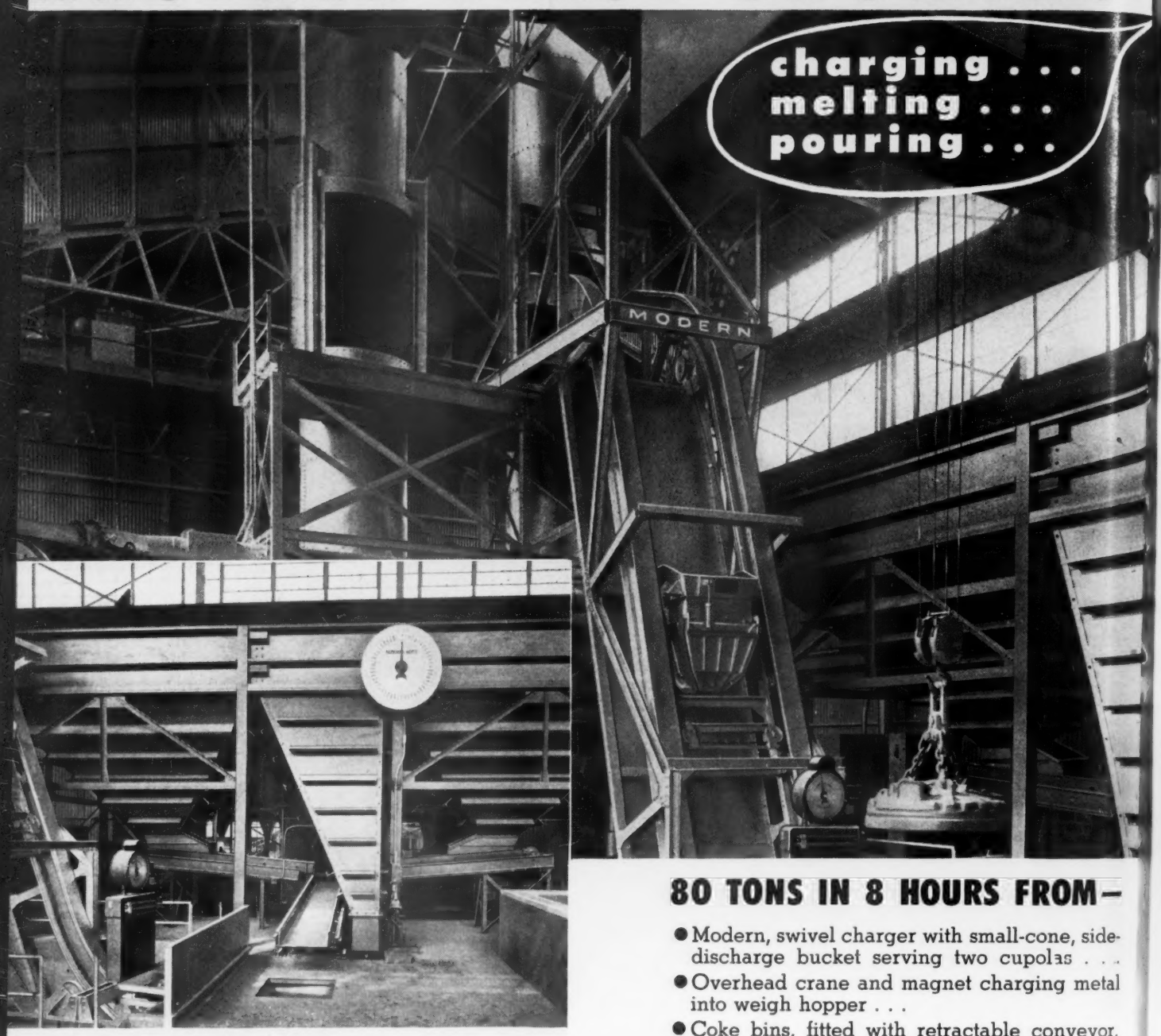
. . . products of

E. F. HOUGHTON & CO.

PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

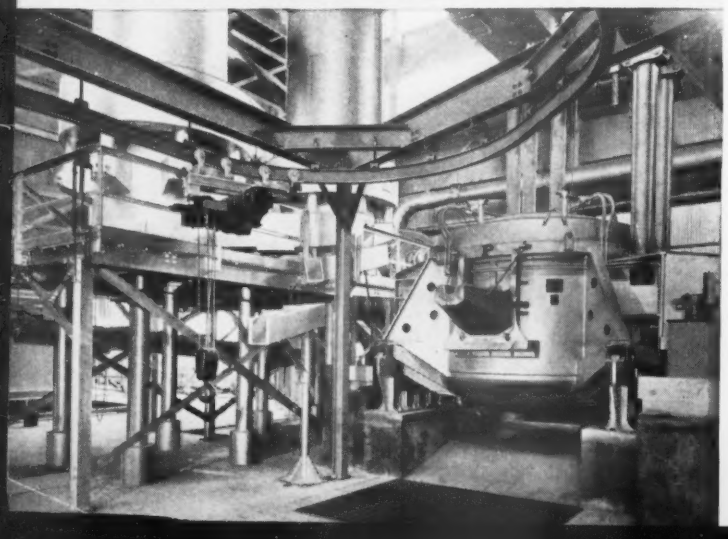
Ready to give you on-the-job service . . .

ANOTHER FIRST SHOWING



Stone and two compartment coke bin with conveyors feeding coke to central, retractable conveyor. Large dial aids the crane operator in preparing accurate charges.

Front view of duplexing operation. Tilting, cupola spout directs metal to either the electric furnace or to a secondary, swiveling spout for filling the ladles. Cupolas are designed for future, hot blast installation.



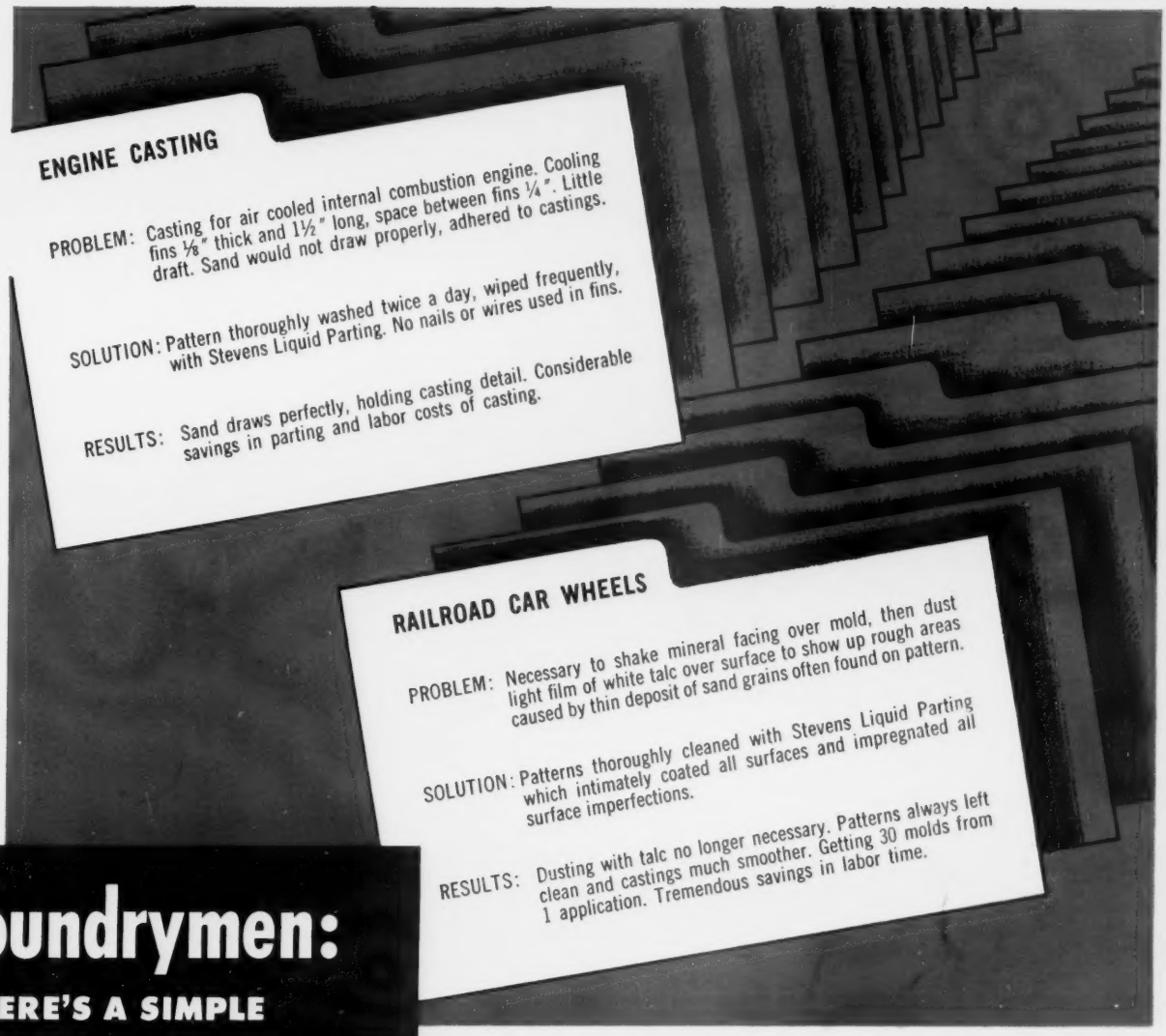
80 TONS IN 8 HOURS FROM—

- Modern, swivel charger with small-cone, side-discharge bucket serving two cupolas . . .
- Overhead crane and magnet charging metal into weigh hopper . . .
- Coke bins, fitted with retractable conveyor, convey the coke to the weigh hopper . . .
- Two, 78″, Modern cupolas with—water type spark arrestors, water slag removal, centrifugal blowers and automatic control equipment . . .
- From cupolas the metal flows through furnace to Modern distributing ladles and on to the pouring floors . . .

This installation — synchronized for high tonnage and low operating cost at Fairbanks, Morse & Company in Kansas City is showing at Cleveland. Plan to see the colored translites! These and other new, interesting, MODERN DEVELOPMENTS are on display in booths 1112 and 1205, Upper Lakeside Hall . . .

MODERN

MODERN EQUIPMENT COMPANY
Port Washington, Wisconsin
BOOTHS 1112 AND 1205


ENGINE CASTING
PROBLEM: Casting for air cooled internal combustion engine. Cooling fins ⅛" thick and 1½" long, space between fins ¼". Little draft. Sand would not draw properly, adhered to castings.
SOLUTION: Pattern thoroughly washed twice a day, wiped frequently, with Stevens Liquid Parting. No nails or wires used in fins.
RESULTS: Sand draws perfectly, holding casting detail. Considerable savings in parting and labor costs of casting.
RAILROAD CAR WHEELS
PROBLEM: Necessary to shake mineral facing over mold, then dust light film of white talc over surface to show up rough areas caused by thin deposit of sand grains often found on pattern.
SOLUTION: Patterns thoroughly cleaned with Stevens Liquid Parting which intimately coated all surfaces and impregnated all surface imperfections.
RESULTS: Dusting with talc no longer necessary. Patterns always left clean and castings much smoother. Getting 30 molds from 1 application. Tremendous savings in labor time.

Foundrymen:

HERE'S A SIMPLE FORMULA FOR CUTTING MOLDING COSTS!

1 good parting = 6 good savings

Many foundries, such as those above, prefer Stevens Liquid Parting because it solves "hard-to-solve" molding problems. But its day by day economy in normal molding operations has played an even greater part in making it *the world's largest selling liquid parting.* Here's how Stevens Liquid Parting saves money for you every day:

1. Gives up to 60 molds per application . . . saves hours of molder's time.
2. Keeps patterns and core boxes completely free of adhering sand.
3. Thoroughly cleans, prevents rust on metal plates, patterns, etc.
4. Eliminates any need for heating patterns or plates.
5. Eliminates inhalation of dry parting dust, improving efficiency.
6. Eliminates sand adherence on sand hoppers, shovels and other sand-handling equipment.

Put the Stevens Liquid Parting formula for savings to the test. Apply it to your molding operation. Call your Stevens Representative for a sample today. Or write direct to FREDERIC B. STEVENS, INC., Detroit 16, Michigan.

Visit our Exhibit at the AFS Foundry Congress and Show in Cleveland, May 8-14

Exclusive sales agents for Sutter foundry equipment in the United States.
See the Sutter Products advertisement on pages 55, 56, 57, 58

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EVERYTHING FOR A FOUNDRY
DETROIT 16, MICHIGAN

It isn't the equipment but...

the *lack of it*

that costs you money!

• *EQUIPMENT* properly designed — properly engineered — properly built and properly maintained eliminates bottlenecks and inefficiencies that cost you money. Let us show you how Bartlett-Snow sand handling, mold conveying and casting cleaning systems will automate your plant operations and assure the smooth, synchronized flow of materials from sand and metal storage to the shipment of finished product. You'll be money ahead. In many cases the initial investment is repaid in from 12 to 15 months.

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